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THE UNIVERSITY OF ALBERTA

AN ANALYSIS OF ALBERTA'S BEEF CATTLE INDUSTRY PROBLEMS

by

© ANTHONY VAN DEURZEN

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF

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FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read and recommend to the Faculty of Graduate Studies and Research for acceptance, a thesis entitled "An Analysis of Alberta's Beef Cattle Industry Problems" submitted by Anthony Van Deurzen in partial fulfilment of the requirements for the degree of Master of Science.

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Date July 30, 1973

ABSTRACT

Beef production in Alberta has gained a prominent position in the provincial economy and has become a chief source of revenue both on the microeconomic and macroeconomic levels. In fact, in 1972, the farm cash receipts from cattle and calves were nearly double those of wheat, the next most important enterprise.

The primary objective of this study was to take an inventory of the major problems associated with the production and marketing of cattle and calves so as to establish priorities in the allocation of scarce research funds.

The analytical procedure used in the research consisted of identification of problems and ranking of these in order of importance, both by frequency of occurrence and geographic location. In addition, estimates of financial loss in profits for the various problems and their economic impact were examined and quantified. A sample of 1,020 beef producers, who were classified on the basis of type and size of operation and by geographic location, provided the data base for the research.

The general conclusion from this study was that difficulties in the reproductive and disease facets of livestock production are the most pressing problems encountered by livestock producers, both in terms of frequency of reporting and financial reduction in profit. More specifically, these major problems consisted of: (a) vibriosis, (b) sterile cows, (c) calf scours, and (d) pneumonia. Furthermore, bloat appeared to be

the greatest nutritional problem while cattle rustling and grading were the major miscellaneous and marketing problems, respectively.

Recommendations based upon the findings of this study are as follows. First, that more funds and resources be directed toward research into the four main problem areas (vibriosis, sterile cows, calf scours, and pneumonia). Second, that the provincial department of agriculture undertake a program to upgrade the knowledge and managerial ability of those livestock producers who need such upgrading. Third, that the feasibility of alternative methods of marketing of beef cattle be investiated. And finally, that cattle rustling be given serious consideration by those responsible for dealing with same so as to alleviate the problem.

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CHAPTER I

INTRODUCTION

Alberta is the foremost beef producing province in Canada. Income from cattle and calves is important to agriculture in Alberta for several reasons. First, the large acreage devoted annually to feed grain production, particularly barley, is utilized mainly within the province, with proportionately less moving through export channels as the livestock industry expands. Second, receipts from the production of livestock are a stable source of income over the long run. This is a crucial component in the future financial planning of the individual farm unit.

Third, one should not underestimate the province's large grazing potential--consisting of underutilized grassland--as well as land which is presently not devoted to agriculture. Underutilized grassland refers to the large number of unimproved grassland acres which at present produce only a fraction of their potential.

In addition to an absolute increase in beef cattle numbers in the province, there has been a significant change in the relative importance of beef production as a source of total farm income. If cash receipts from cattle and calf production are to remain the major component of income on Alberta farms, it is all-important to the province's economy that this form of primary production remain not only viable, but that the industry be augmented through more efficient production.

Livestock Numbers

On a national basis, Alberta has increased its share of Canada's total cattle and calf population. The figures in Table 1 substantiate this in some detail. Today, Alberta is the leading province in numbers of cattle and calves, followed by Ontario and Saskatchewan, respectively. Prior to 1966 Ontario had the greatest cattle population. Table 1 also shows that the rate of increase in cattle and calf populations in Alberta has been more rapid than in any other province in Canada. Quebec is the fourth most important in cattle and calf numbers, followed by Manitoba, while the remaining five provinces are realtively insignificant insofar as cattle numbers are concerned.

As alluded to above, cattle numbers in Alberta have increased significantly. As Table 2 indicates, during the last seventeen-year period (1956-1972) the total number of cattle and calves in the province has steadily increased--except for the years 1966-1968, when there were ready markets for grains and, consequently, livestock production declined somewhat.

Trends within Alberta itself are also of interest. Of all seven Agricultural Reporting Areas (A.R.A.),[1] Areas 3, 4, and 5 are of special significance in that they account for 59 percent of the province's total cattle and calves in 1971. Table 2 and Figure 1 indicate that the rate of increase in cattle numbers since 1956 has been substantial in the northern areas of Alberta. However, since 1966, the increase has been

---

[1] An Agricultural Reporting Area is defined as a geographical area being composed of one or a combination of Census Divisions.

TABLE 1

NUMBERS OF CATTLE AND CALVES ON FARMS IN CANADA, PROVINCES, AND REGIONS, JUNE 1, 1935-1972

Province	1935-39	1949	1951	1956	1961	1966	1967	1968	1969	1970	1971	1972	1972[a]
						('000)							
Prince Edward Island	97	90	98	124	121	125	122	118	117	119	117	103	93
Nova Scotia	218	169	166	187	164	148	146	144	141	140	138	130	125
New Brunswick	210	172	162	184	160	136	131	130	128	123	123	110	96
Maritime Provinces	525	431	426	495	445	409	399	392	382	382	378	343	314
Quebec	1,736	1,699	1,641	2,002	1,915	1,798	1,796	1,847	1,895	1,945	1,958	1,776	1,587
Ontario	2,516	2,642	2,466	2,902	3,116	3,137	3,165	3,220	3,204	3,162	3,118	3,116	3,170
Manitoba	778	758	671	872	996	1,151	1,112	1,037	1,019	1,120	1,190	1,176	1,062
Saskatchewan	1,375	1,368	1,275	1,869	2,212	2,398	2,368	2,223	2,180	2,386	2,643	2,770	2,392
Alberta	1,491	1,595	1,563	2,449	2,879	3,440	3,405	3,322	3,380	3,535	3,825	3,881	3,669
Prairie Provinces	3,544	3,621	3,509	5,190	5,996	6,989	6,885	6,582	6,579	7,041	7,658	7,827	7,123
British Columbia	295	328	321	423	462	546	536	525	522	530	548	594	532
Canada	8,716	8,821	8,363	11,012	11,934	12,879	12,781	12,566	12,586	13,060	13,660	13,656	12,726
Alberta's Share of Canada, in Percent	17.1	18.1	18.7	22.3	24.2	26.7	26.6	26.4	26.9	27.0	28.0	28.4	28.8

[a] December 1, 1972.

Source: C.D.A., Agricultural Statistics for Canada, Publication 71/6 (Ottawa: C.D.A., April, 1971), pp. 50-53; Dominion Bureau of Statistics, Report on Livestock Surveys: Cattle, Sheep, Horses, Catalogue No. 23-004 (Ottawa: D.B.S., August, 1971).

TABLE 2

TOTAL CATTLE AND CALVES ON FARMS IN ALBERTA
BY AGRICULTURAL REPORTING AREA, JUNE 1, 1956-72

Year	Agricultural Reporting Area[a]							Province
	1	2	3	4	5	6	7	
	('000)							
1956	318.8	374.0[b]	517.9[b]	531.3[b]	384.8[b]	230.0	92.4	2449.2
1957	332.4	423.6	578.2	554.2	404.2	234.9	93.5	2621.0
1958	316.5	398.3	556.6	560.4	396.9	234.9	93.4	2557.0
1959	317.1	429.3	578.0	557.1	408.0	235.5	98.0	2623.0
1960	327.3	441.1	577.3	563.4	433.3	253.9	100.7	2697.0
1961	353.3	471.9	578.0[b]	598.7[b]	485.1[b]	276.2[b]	116.2	2879.4
1962	318.6	447.0	583.9	606.4	505.4	305.8	131.9	2899.0
1963	328.3	458.2	600.4	657.7	534.5	325.4	130.5	3035.0
1964	364.8	519.0	647.6	715.4	575.4	362.7	135.1	3320.0
1965	394.6	541.0	664.3	729.4	607.0	388.8	147.9	3473.0
1966	380.5	498.2	664.1	720.5	642.1	398.1	136.2	3439.7
1967[c]	392.7	502.8	655.4	715.3	630.7	393.3	114.8	3405.0
1968[c]	381.9	478.0	683.6	671.9	607.4	391.1	108.1	3322.0
1969[c]	391.6	492.0	701.3	670.8	608.7	398.4	117.3	3380.1
1970[c]	409.7	498.8	758.1	694.9	643.6	412.8	117.1	3535.0
1971[c]	414.2	533.0	844.7	765.9	694.9	452.8	119.5	3825.0
1972[c]	459.0	635.6	765.5	755.5	706.6	414.0	136.1	3872.3

[a] Agricultural Reporting Areas are composed of one or more Census Divisions.

[b] Do not balance by Region.

[c] Calculated from Alberta Department of Agriculture Statistics Branch information.

Source: Alberta Department of Agriculture Statistics Branch, in co-operation with Statistics Canada.

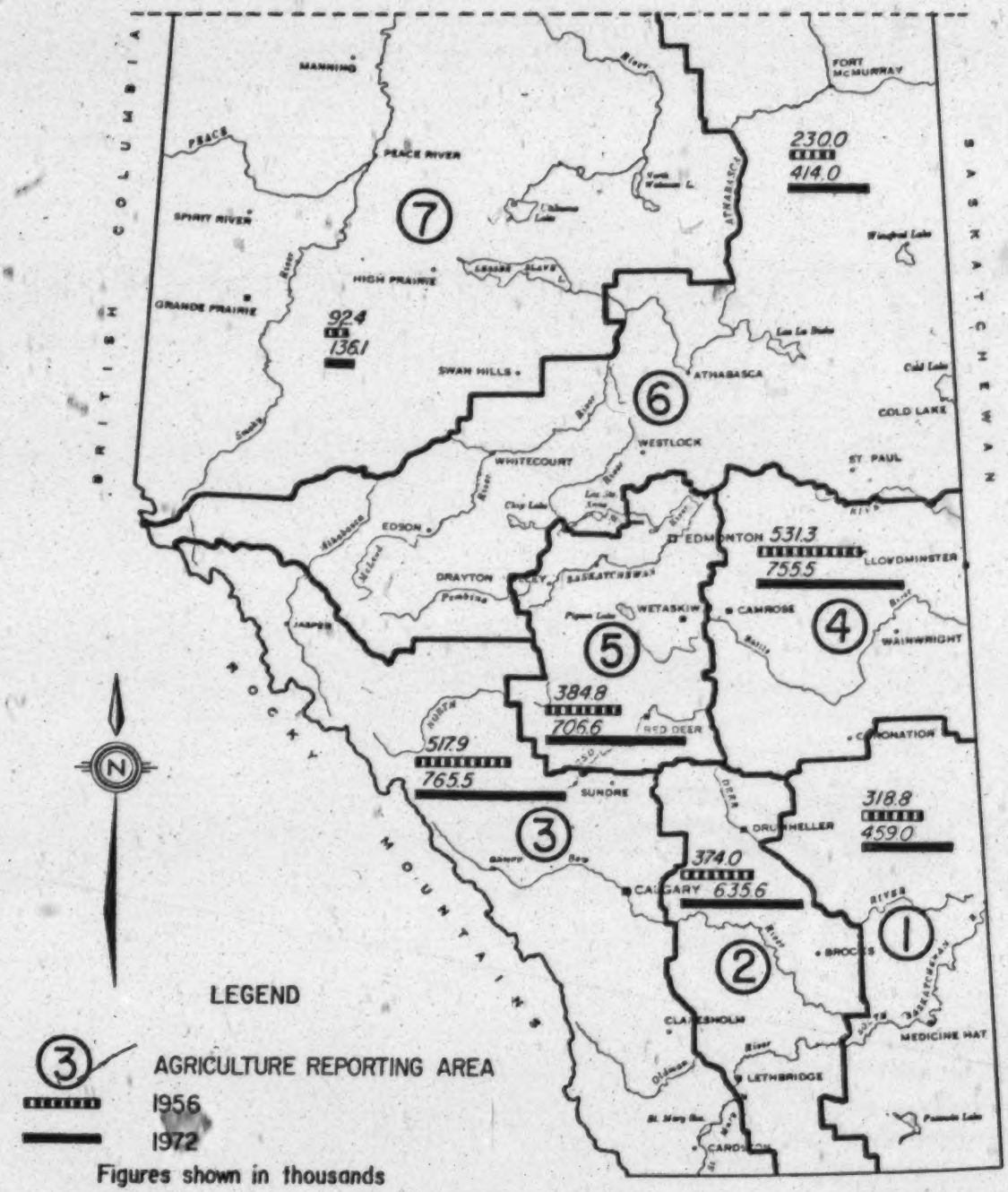

FIGURE 1

CHANGES IN CATTLE POPULATION FOR THE PERIOD 1956-1972
BY AGRICULTURAL REPORTING AREA

most dramatic in A.R.A. 2 followed by A.R.A.'s 1 and 3 (see Table 3).

In summary, it appears that the rate of increase in population since 1956 has been province-wide, but the greatest increase has occurred in A.R.A. 2 during the last seven years. This is substantiated by the percentage changes by A.R.A. for the seven-year period 1966-1972, which have been calculated from Table 2 and presented in Table 3. Figure 1 shows the increase of cattle within the province in absolute numbers since 1956.

Livestock Returns

Total farm cash receipts from the sale of cattle and calves in Alberta has increased from 86 million dollars in 1956 to nearly 260 million dollars in 1970.[1] For the year 1971, estimated cash receipts from cattle and calves were $268,049,000.[2] Total farmers' cash receipts from farming operations, including supplementary payments, for the same year were $776,934,000, indicating that cattle sales create a substantial portion of the total Alberta farm receipts.[3]

Table 4 indicates that receipts from cattle and calves in Alberta constitute an important part of total provincial cash sales. Beef cattle production in Alberta is more important to the provincial farm income than is the case in other provinces. It is interesting to note that cash

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[1] C.D.A., Agricultural Statistics for Canada, Publication 71/6 (Ottawa: C.D.A., April, 1971), p. 62.

[2] Alberta Bureau of Statistics, Alberta Business Trends (Edmonton: A.B.S., March, 1972), p. 2.

[3] Statistics Canada, Farm Cash Receipts, Catalogue 21-001 (Ottawa: D.B.S., December, 1972), pp. 4-13.

TABLE 3

CATTLE POPULATION CHANGE IN ALBERTA
BY AGRICULTURAL REPORTING AREA, 1966-1972

Agricultural Reporting Area	Population 1966	Population 1972[a]	Percent Change
	('000)		
1	380.5	459.0	20.6
2	498.2	635.6	27.6
3	664.1	765.5	15.3
4	720.5	755.5	4.8
5	642.1	706.6	10.0
6	398.1	414.0	4.0
7	136.2	136.1	-0.1
Province	3439.7	3872.3	12.9

[a] Calculated from A.D.A. Statistics Branch information.

Source: A.D.A., Statistics Branch, in co-operation with Statistics Canada.

receipts from cattle and calves in Alberta for 1972 were nearly 33 percent of total provincial cash receipts from farming operations, while for Canada as a whole, this figure was 22 percent. However, the receipts from cattle and calves in Alberta for 1972 constituted only about 6 percent of the total Canadian cash receipts from farming operations.

Because of its large and relatively cheap land base, which is conducive to feed grains production as well as to enhancing its pasture supplies, it appears that the greatest potential for increasing beef

production lies in western Canada. According to the Task Force Report,[1] the majority of feeder cattle will continue to be raised in the West. In addition, south-central Alberta, along with southern Ontario and British Columbia, is where most of the feeding will likely be done.

Inasmuch as cattle are such an important enterprise in Alberta agriculture, and because its cattle industry has grown so rapidly relative to other parts of Canada, it appears that Alberta must have a comparative advantage in beef production. It is hoped that this study will assist in keeping Alberta competitive through an expanding, efficient beef industry.

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[1] Federal Task Force on Agriculture, Canadian Agriculture in the Seventies

TABLE 4

FARM CASH RECEIPTS FROM FARMING OPERATIONS, 1972

Province	Cash Receipts from Farming Operations	Supplementary Payments	Total Cash Receipts	Cattle and Calves	Cattle and Calves Sales as % of Total Cash Receipts
			($'000)		
Prince Edward Island	43,897	--	43,897	9,602	21.9
Nova Scotia	68,319	--	68,319	11,259	16.5
New Brunswick	64,288	--	64,288	9,893	15.4
Quebec	758,918	7,523	766,441	108,224	14.1
Ontario	1,548,545	7,495	1,556,040	385,481	24.8
Manitoba	475,451	9,279	484,730	100,673	20.8
Saskatchewan	1,166,562	31,609	1,198,171	225,898	18.9
Alberta	893,623	20,213	913,836	298,287	32.6
British Columbia	244,830	673	245,503	48,925	19.9
Canada	5,264,433	76,792	5,341,225	1,198,242	22.4

Source: Statistics Canada, Farm Cash Receipts, Catalogue 21-001 (Ottawa: D.B.S., December, 1972), pp. 4-13.

CHAPTER II

PERSPECTIVE AND PROBLEM ANALYSIS OF THE INDUSTRY

Present Situation

The situation of the cattle industry at present has resulted from both an increased demand for beef and an excess feed grain supply which prompted many grain farmers to convert their unsold grain into cash by marketing it through livestock producers. With many resources devoted to this segment of the agricultural industry, it becomes imperative that they be utilized to best advantage so that Alberta producers may effectively compete with producers in other provinces and in the United States. It is also important that any problems existing or arising be identified, analyzed, and remedied.

Problems Associated with Industry Expansion

With the expansion of the livestock industry in Alberta, one anticipates not only an increase in the magnitude of the existing probems, but also some newly created problems with which stock growers must cope. These are caused by a variety of factors, some of which can be readily identified, while others may be more subtle. Some of the readily identifiable factors can be listed as (a) novice producers lacking the necessary management skills entering the industry, (b) the increase in the cattle population per se, and (c) the huge grain stocks at the turn of this decade which, coupled with an increased demand for beef, caused stock growers to be more concerned with meeting that increased demand than continuing top management practices, particularly in the areas of breeding

and disease. For example, the higher cost of good quality bulls has rendered some livestock producers less than meticulous in sire selection. Hence some careless breeding has likely occurred and resulted in unthrifty calves, among other undesirable results.

Another factor of considerable significance during the last few years is the advent of exotic breeding. The continuous proliferation of many exotic breeds entering the country has further added to the intricacies inherent in the cattle production cycle. Many livestock producers are independently researching and experimenting with exotic breeds. This often causes considerable difficulty and financial loss due to lack of adequate information about the use of exotics in cross breeding.

Furthermore, intensification of livestock production has resulted in greater movement of cattle numbers, both intra-provincially and inter-provincially. With more cattle changing ownership and location, one would expect them to be predisposed to diseases to a greater extent than would normally be the case. This will in turn affect reproduction in the animals since some diseases and breeding problems are linked.

Diseases such as calf scours and hemorrhagic septicemia, to name a few, would occur more frequently under intensified production. As many community pastures reach operating capacity one would expect calf scours to become a greater problem because more drylot and semi-drylot cow-calf operations must be established. Hemorrhagic septicemia results largely from weather conditions and feeding practices during shipment of cattle and is easily contracted.

As more cattle are being fed out, nutrition takes on a new dimension in livestock production. In such a situation it is not only

imperative that the livestock feeder have a good knowledge of animal nutrition, but that he consider the least-cost component of livestock feeding as well.

The marketing of cattle also plays an important role in livestock production. For example, grading, selling, transportation, and marketing information are important aspects of the marketing process. The advent of the new beef grading system certainly has turned a new leaf in the production of beef, the ramifications of which have yet to be evaluated. The aforementioned problems, then, have caused a definite need for the study of the problems affecting the cattle industry at the farm level.

Objectives of the Study and Its Anticipated Use

If western Canada is to expand its livestock marketings both domestically and abroad, it is imperative that an efficient industry which can overcome livestock problems to the greatest possible extent be developed; this being prerequisite if the challenge of continuity of supply is to be met.

This research project has two significant objectives. The first is to analyze on a province-wide basis the major or chronic problems causing difficulty in the production and marketing of cattle. This is to be done by estimating the scope, frequency, severity, and geographic location of these problems. The second objective--and perhaps the major one--is to analyze these problems for economic costs to the farmer, to the livestock industry, and to the province, in order that the analysis can be used as a guide in establishing research priorities for utilization of scarce funds.

CHAPTER III

STUDY METHODOLOGY

Preamble

Before proceeding with an explanation of the analytical procedure used in the study, it will be useful to outline the general approach used. To eliminate undue bias from entering the data and, subsequently, the analysis, it was considered essential to obtain a sample of cattle producers which was representative on a province-wide basis. Furthermore, statements of the major factors which cause difficulty in the production and marketing of cattle were sought by way of a questionnaire in such a way that the information would portray production problems exactly as producers perceived them.

The initial plan was to obtain problem statements from approximately 1,400 producers which could be analyzed by statistical methods and cross-classification in order to discover the most frequent problems and to rank these in order of their importance to the cattle industry. In addition, an economic cost analysis utilizing the output multiplier was planned for use in attaching pecuniary costs (resulting from the loss of profit in production) to the farmer, the livestock industry, and the province.

Sample and Sampling Technique

A systematic sample of livestock producers was drawn from the provincial livestock brands book, which lists 32,790 brand holders.

In this sampling technique, the members of the population are listed in an orderly way and sampling units are selected at fixed intervals. The first unit is randomly selected and the desired number of sampling units selected.

In this particular study, every tenth livestock brand holder was selected from an alphabetical listing out of the provincial brand book. Thirty questionnaires were sent out for pre-testing in order to discover whether any questions would be misconstrued by the producers in the sample. A total of 3,279 questionnaires were sent out in the first mailing. Those producers not responding to the first mailing were sent a second questionnaire. In addition, where the sample livestock producer was deceased, had terminated his farming operation, or where it was impossible to locate the producer for other reasons, the name next to the original selection was chosen and a questionnaire was sent out in the subsequent mailing. The time period during which both mailings were made and questionnaires returned was January to April, 1972.

The Questionnaire

The questionnaire was designed to secure information concerning the major or chronic problems afflicting the cattle producer as perceived by the cattle producer himself. Producer opinions concerning problems of all cattle producers as well as their individual problems were sought for each of the following major subdivisions of the industry: (1) breeding, (2) disease, (3) nutrition, and (4) marketing. In addition, a question regarding miscellaneous problems and general information about the farm and its management (such as type of enterprise, trading centre, and financial losses encountered by their respective problems) was included.

Response

The return of questionnaires was reasonably good with some 1,020 useful questionnaires returned. This was considered to constitute an adequate sample, being approximately 3 percent of the total number of livestock brand holders. There were some forty instances where questionnaires were sent in the first mailing and no response was obtained due to recent death, termination of farming operations, or inability to locate the producer. Also, in some cases only the livestock enterprise was discontinued in the farming operation. It was also discovered that many brandholders are not cattle producers, but hold the brand for traditional family reasons.

Analysis

Agricultural Reporting Areas, being composed of one or more census division for which data was readily available, seemed to be the most logical basis on which to establish boundaries for the sub-areas of the province or individual study areas. These boundaries facilitated the analytical procedure. Figure 2 delineates the boundaries for the Agricultural Reporting Areas (A.R.A.). The Agricultural Reporting Area, rather than the census division, provided a larger base from which statistical analysis could proceed.

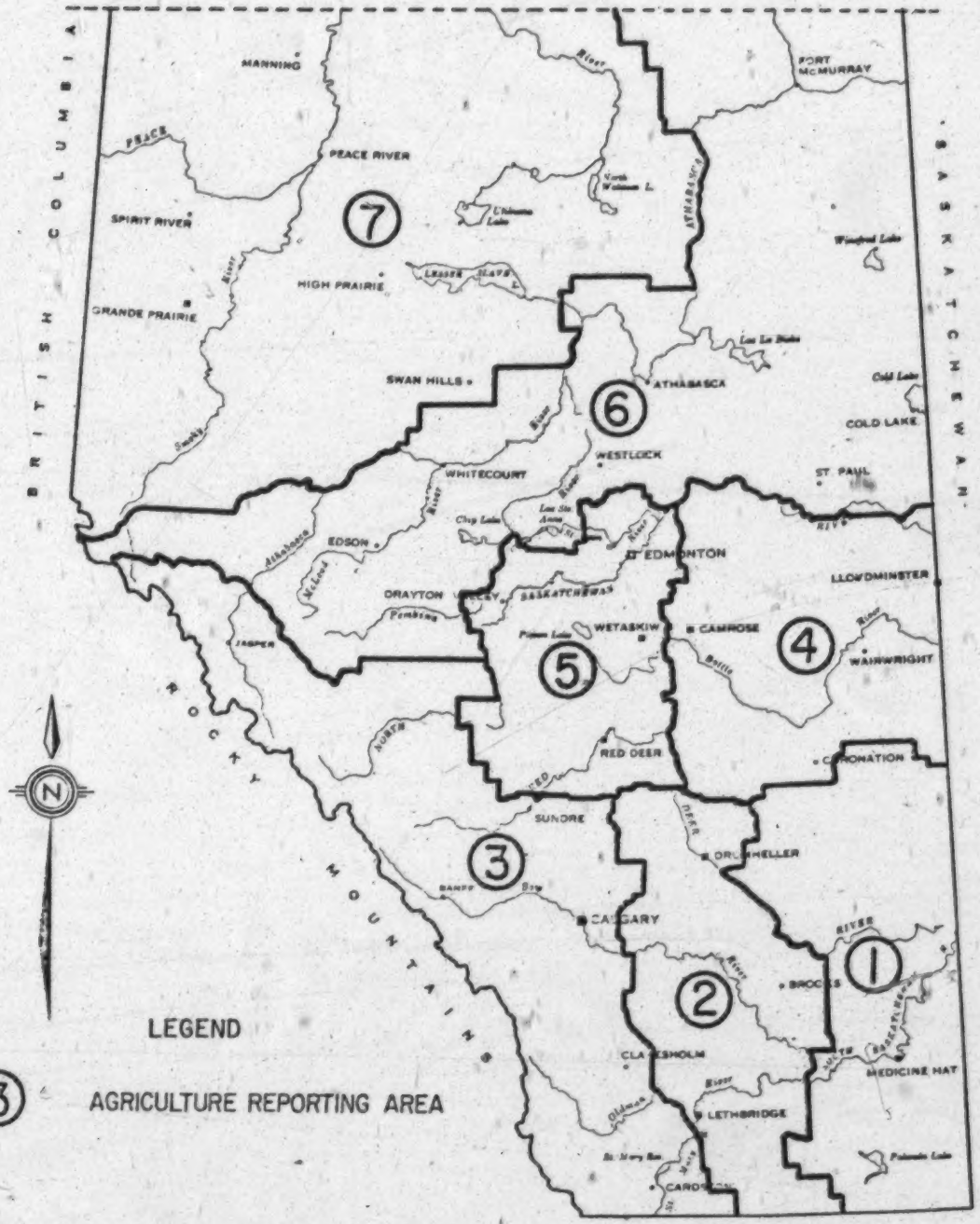

FIGURE 2

MAP SHOWING AGRICULTURAL REPORTING AREAS

CHAPTER IV

THE STUDY DATA AND ITS ANALYSIS

Problem Perception

Prior to proceeding with the actual coding and subsequent analysis of the data, it is important to note that the problems as perceived by the sample participants were coded as such. No attempt was made to place any particular problem variable into only one major problem area when such a problem variable appeared in more than one major area, although the same code for that variable was used. For example, bloat was reported by some producers as a disease, while others reported it as a nutrition problem. In each category bloat was coded 37.

While the questionnaire requested the sample producers to state the major problems affecting the livestock producing industry, it is interesting to notice that in many returned questionnaires the same problems which were encountered by the individual producer were also perceived as being the industry's problems. Furthermore, in many questionnaires only the individual operator's problems were reported while in others only those of the industry were included.

To obtain a more accurate insight into the problems as they affect the livestock industry, it was decided to base the analysis on the problems as the producer perceived them in his own situation or operation since this would more accurately reflect the problems as they exist in the field.

Assembly of Data

Each of the returned questionnaires was carefully read and coded using a numerical coding procedure. Where different problem statements related to the same subject or basic nature of the problem, the variations were grouped and described under the same code so as to preclude the coding system from becoming unnecessarily complex.

The problems as described by the producers were coded under the major problem area in which they were given to prevent distortion in the nature of the original data. A communication problem appeared evident in that certain problems did appear under more than one major heading. For instance, vibriosis and infectious bovine rhinotracheitis (IBR) were reported both under breeding problems and under diseases. Similarly, bloat and hemorrhagic septicemia (the latter commonly known as shipping fever) were reported under diseases as well as under nutrition problems. However, in the cost analysis, the duplicated problems were aggregated in order to obtain a true estimate for this purpose. Problem variables in each major area with a reporting frequency greater than five were considered to be important for purposes of analyzing the data. Problem variables falling outside this category were assumed to be of a minor nature and not important enough to carry through the analysis. They are, however, shown in Appendix B, Tables B.1-B.5. As stated previously, the five major problem areas examined were: (1) breeding, (2) disease, (3) nutrition, (4) marketing, and (5) miscellaneous problems.

The trading area reported was also coded on each questionnaire, as well as its geographic location by Agricultural Reporting Area. Also, the producer's mailing address was coded. It is important to note that

all the problem variables under each major problem area, with the exception of marketing, were coded according to mailing address for geographical identification of the problem. In marketing problems, the problem variables designated by (T) in Figure 6 were geographically identified according to trading address, whereas those variables designated by (M) were geographically identified according to mailing address. The reason for this differentiation was to describe the marketing problems as accurately as possible. For example, if a cattle producer who resides in one A.R.A. and markets his cattle in another reports a grading problem, erroneous information may be recorded if his mailing address had been used to obtain the geographic location of the problem. In such a case, the trading centre (T) must be used for this problem variable.

Physical Data Analysis

Producer Classification

As a preliminary to the analysis of the data, the producing units were stratified according to size and type of enterprise(s). Table 5 shows the following three enterprises having the greatest number of producers: (1) cow-calf--sold as calves; (2) cow-calf--sold as yearlings; and (3) cow-calf--calves fed out and sold. Furthermore, most of the producers having these types of enterprises have less than a total of 300 animals on their farms (see Table 6). In fact, slightly more than 85 percent of the producers in the sample had fewer than a total of 299 animals on their farm, with the largest number of operations having from 0-99 as a total number of animals in their livestock operation. With further reference to Table 5, it is interesting to note that the 1000+

TABLE 5

SAMPLING DISTRIBUTION OF CATTLE PRODUCERS, STRATIFIED BY SIZE CATEGORY AND TYPE OF CATTLE ENTERPRISE[a]

Type of Enterprise	Size of Operation (Number of Animals Per Farm)										
	0 - 99	100 - 199	200 - 299	300 - 399	400 - 499	500 - 599	600 - 699	700 - 799	800 - 899	900 - 999	1000+
Cow-Calf--sold as calves											
Main enterprise	252	111	31	12	4	1	0	0	0	0	5
Second enterprise	30	23	8	6	2	1	3	0	0	0	0
Cow-calf--sold as yearling											
Main enterprise	67	36	14	6	3	1	4	0	0	0	1
Second enterprise	82	44	21	4	1	1	1	0	0	0	3
Cow-calf--calves fed out and sold											
Main enterprise	71	59	29	18	13	2	2	1	3	1	6
Second enterprise	35	26	12	3	6	2	4	1	0	1	2
Purebreed cow herd--selling breeding stock											
Main enterprise	15	4	8	6	2	0	0	0	0	0	1
Second enterprise	13	14	8	2	3	0	0	0	0	0	1
Buy, graze and feed out yearlings											
Main enterprise	16	8	5	2	2	0	1	0	1	0	0
Second enterprise	14	16	6	12	3	2	0	0	1	1	4
Buy, graze and feed out older cattle											
Main enterprise	1	2	1	0	0	0	0	0	0	0	0
Second enterprise	8	5	1	1	0	1	0	0	0	0	0
Feedlot operation--private											
Main enterprise	21	29	14	10	6	5	1	1	2	3	3
Second enterprise	31	45	19	17	7	2	3	1	1	1	3

Table 5 continued

Type of Enterprise	Size of Operation (Number of Animals Per Farm)										
	0 - 99	100 - 199	200 - 299	300 - 399	400 - 499	500 - 599	600 - 699	700 - 799	800 - 899	900 - 999	1000+
Feedlot operation--custom											
Main enterprise	1	1	1	1	0	0	0	0	0	0	4
Second enterprise	0	1	0	0	0	0	0	0	1	0	2
Feedlot operation--private and custom											
Main enterprise	0	0	0	0	0	0	0	0	0	0	4
Second enterprise	1	1	2	0	0	0	0	0	1	0	6
Commercial, dairy											
Main enterprise	21	10	1	0	0	0	0	0	0	0	0
Second enterprise	22	6	1	0	1	0	0	0	0	0	0
Cattle out on shares											
Main enterprise	3	1	0	0	0	0	1	0	0	0	0
Second enterprise	13	2	0	0	0	0	1	0	0	0	0
Other											
Main enterprise	1	1	0	0	0	1	0	0	0	0	0
Second enterprise	3	1	1	0	0	0	0	0	0	0	0
Buy, winter and graze calves											
Main enterprise	10	4	2	0	1	1	0	2	0	0	1
Second enterprise	16	11	4	1	2	0	0	0	1	0	3
Buy, winter and graze yearlings											
Main enterprise	0	1	0	0	0	0	0	0	0	0	0
Second enterprise	5	5	1	0	0	0	1	1	0	0	0

Table 5 continued

Type of Enterprise	Size of Operation (Number of Animals Per Farm)										
	0 - 99	100 - 199	200 - 299	300 - 399	400 - 499	500 - 599	600 - 699	700 - 799	800 - 899	900 - 999	1000+
Buy, winter and graze yearlings of 2 years old											
Main enterprise	1	0	0	0	0	0	0	0	0	0	0
Second enterprise	0	0	0	0	1	0	0	0	0	0	0
Other cattle operations											
Main enterprise	6	0	0	0	1	1	0	0	0	0	0
Second enterprise	4	3	0	0	0	0	1	0	0	0	0

[a] For example, in the 0-99 size category, 252 producers out of a total of 1,020 reported having a "cow-calf--sold as calves" enterprise as their main enterprise, while 30 producers reported having this enterprise as their second most important enterprise.

TABLE 6

SAMPLE FARMS, STRATIFIED BY SIZE CATEGORY, SHOWING THE NUMBER OF OPERATIONS AND THE NUMBER OF CATTLE IN EACH CATEGORY, BOTH BEING EXPRESSED IN PERCENTAGES AND IN CUMULATIVE PERCENTAGES OF THE TOTAL NUMBER OF PRODUCERS IN THE SAMPLE (1,020) AND OF TOTAL NUMBER OF CATTLE IN THE SAMPLE

Size of Operation (By Class)	Number of Operations	Number of Producers as % of Total	Number of Producers (Cumulative Percentage)	Number of Cattle in Sample Population	Number of Cattle as % of Total Sample Population	Number of Cattle (Cumulative Percentage)
0 - 99	494	48.4	48.4	26,600	13.2	13.2
100 - 199	268	26.3	74.7	37,166	18.5	31.7
200 - 299	107	10.5	85.2	25,341	12.6	44.3
300 - 399	55	5.4	90.6	18,427	9.2	53.5
400 - 499	33	3.2	93.8	14,497	7.2	60.7
500 - 599	12	1.2	95.0	6,513	3.2	63.9
600 - 699	12	1.2	96.2	7,646	3.8	67.7
700 - 799	4	0.4	96.6	3,085	1.5	69.2
800 - 899	6	0.6	97.2	4,912	2.4	71.6
900 - 999	4	0.4	97.6	2,816	1.4	73.0
1000+	25	2.4	100.0	54,432	27.0	100.0
	1,020	100.0%		201,435	100.0%	

size category consists of approximately equal numbers of cow-calf operators and feedlot operators.

Table 6 shows that some 90 percent of the cattle producers have less than 400 animals in their livestock operation. The distribution shown in this table does not approximate what would be called a normal distribution of operations with respect to size category. Rather we are dealing with a skewed distribution. If we assume that a representative sample of the province's livestock producers was drawn, we can infer from Table 6 that producers having upwards of 700 animals in their operation are relatively few in number. Consequently, with a distribution such as this, it becomes much more difficult to perform various correlation tests with a significant degree of accuracy or reliability.

The table further indicates that the sample, which represents only about 3 percent of the number of livestock brand holders, deals with more than 3 percent of the province's cattle population, the latter being 3,825,000 head on June 1, 1971. In fact, the number of cattle in the sample population is about 5.3 percent of the total population (according to Table 6). This suggests that returned questionnaires are somewhat biased toward the larger producers who have a larger stake in the success of the beef business.

Geographic Distribution of Sample Population

Table 7 shows the classification of producers both according to geographic location and size of operation. The table indicates that the large-sized operations are located primarily in Agricultural Reporting Areas 1 to 5, inclusive. This phenomenon appears reasonable if we consider the fact that the large cow-calf operations are located in areas of

TABLE 7

OPERATOR DISTRIBUTION OF SAMPLE POPULATION BY AGRICULTURAL REPORTING AREA AND SIZE OF OPERATION SHOWING NUMBER OF OPERATORS AND PERCENTAGE OF TOTAL NUMBER REPORTING IN THE AGRICULTURAL REPORTING AREA

Size of Operation (Number of Animals Per Farm)	Agricultural Reporting Area							Total Number of Producers in Size Category
	1	2	3	4	5	6	7	
0 - 99	38 40.0%	88 46.6%	71 36.6%	112 57.4%	105 55.0%	44 54.3%	36 69.2%	494
100 - 199	28 29.5%	44 23.3%	55 28.6%	56 25.7%	54 28.3%	21 25.9%	10 19.2%	268
200 - 299	13 13.7%	25 13.2%	22 11.3%	22 10.1%	14 7.3%	9 11.1%	2 3.9%	107
300 - 399	6 6.3%	9 4.8%	15 7.7%	13 6.0%	6 3.1%	4 4.9%	2 3.9%	55
400 - 499	2 2.1%	9 4.8%	11 5.7%	5 2.3%	3 1.6%	1 1.2%	2 3.9%	33
500 - 599	1 1.0%	3 1.6%	4 2.1%	1 0.4%	2 1.0%	1 1.2%	-	12
600 - 699	4 4.2%	2 1.0%	2 1.0%	2 0.9%	1 0.5%	1 1.2%	-	12
700 - 799	-	-	3 1.5%	-	1 0.5%	-	-	4
800 - 899	1 1.0%	-	3 1.5%	1 0.4%	1 0.5%	-	-	6
900 - 999	-	1 0.5%	2 1.0%	1 0.4%	-	-	-	4
1000+	2 2.1%	8 4.2%	6 3.0%	5 2.3%	4 2.1%	-	-	25
Total Number of Producers Sampled	95	189	194	218	191	81	52	1,020

NOTE: For example, in the 200-299 size category 25 producers or 13.2 percent of the total number of 189 producers sampled in Agricultural Reporting Area 2 have between 200 and 299 animals.

abundant range land, such as Agricultural Reporting Areas 1, 2, and 3. Conversely, we would expect the large feedlots to be located in Agricultural Reporting Areas 4 and 5, which are located in areas where there is a good supply of feed grains. Furthermore, these feedlots are located in close proximity to meat packing centres.

Explanation of Specific Problem Variables

The following all-inclusive problem variables used in the analysis warrant further explanation: (a) "artificial insemination" and "poor management" under breeding problems; (b) "pink eye" and "cancer eye" under disease problems; and (c) "poor management" under nutrition problems.

"Artificial insemination" includes such problems as low grade semen and rate of conception. "Poor management" under the same major problem area includes problems encountered by the operator which are considered to be basic knowledge in herd management. "Pink eye" and "cancer eye" are different diseases and were tabulated as given in the returned questionnaires. Pink eye is a severe inflammatory bacterial infection of the eye, whereas cancer eye is due to a tumor or cancer developing in the eye. The problem variable "poor management" under nutrition problems consists of factors which are considered to be basic knowledge in nutrition of animals, such as providing adequate feed and water supplies for the winter period and starting cattle gradually on grain.

The Five Major Problem Areas

1. Breeding Problems -- Table 8 summarizes the major breeding

problems as reported by the individual producers. "Vibriosis" and "sterile cows" appear to be the greatest problems afflicting cattle producers and, in particular, the small producer having fewer than 300 animals in his total operation. These two problems affected the producers in the sample to the extent of 10 percent and 7 percent, respectively. Vibriosis can be expected to be closely related to sterile cows by virtue of unobserved abortion in the first three months of pregnancy. This is also true for infectious bovine rhinotracheitis, which, for yet unexplained reasons, became a prominent cause of abortion in the last several years.

Relatively speaking, it appears that breeding problem frequency diminishes among the larger size operations. This occurrence is presumably due to the larger operators being more knowledgeable about livestock reproduction and preventive medicine such as vaccination.

Figure 3 summarizes the major breeding problems, ranked according to frequency of reporting. Problem variables with a frequency of five or less were considered to be of a minor nature, and these are recorded in Table 23 of Appendix B.

Table 9 indicates the importance of breeding problems both by Agricultural Reporting Area and according to decreasing order of importance, with the mostimportant problems being listed first.

Blank spaces within the table lead us to an important question: Are certain problems in these specific Agricultural Reporting Areas not encountered? Not diagnosed? Or is it a type of producer operating in that area who has inadequate knowledge of livestock production and its associated problems?

2. Disease Problems -- Under this heading a total of thirteen

TABLE 8

INCIDENCE OF MAJOR BREEDING PROBLEMS REPORTED, STRATIFIED BY SIZE CATEGORY, SHOWING FREQUENCY OF EACH BREEDING PROBLEM EXPRESSED AS A PERCENTAGE OF TOTAL PRODUCERS WITHIN EACH SIZE CATEGORY AND TOTAL NUMBER OF PRODUCERS REPORTING EACH BREEDING PROBLEM EXPRESSED AS A PERCENTAGE OF THE TOTAL SAMPLE OF 1,020

Breeding Problem	Size of Operation (Number of Animals Per Farm)											Total No. of Producers Reporting the Problem	No. of Producers Reporting as a Percentage of Total Sample of 1,020
	0 - 99	100 - 199	200 - 299	300 - 399	400 - 499	500 - 599	600 - 699	700 - 799	800 - 899	900 - 999	1000+		
	(Number of Respondents)												
Vibriosis	33	36	16	7	5	1	-	1	-	-	1	100	10
Sterile Cows	28	18	4	8	4	1	2	-	1	-	1	67	7
Calving Difficulty	25	10	5	2	1	2	-	-	-	-	1	46	4
Inferior Quality Bulls	11	10	5	2	1	-	1	-	-	-	1	31	3
Artificial Insemination	15	7	2	2	1	-	-	-	2	-	-	29	3
Poor Management	11	10	2	-	-	-	2	-	-	-	-	25	2
Infectious Bovine Rhinotracheitis	8	6	3	-	1	-	-	-	1	1	1	21	2
Abortion	6	5	1	1	1	-	-	-	-	-	-	14	1
Malnutrition, Knowledge of Feed Ration Formulation	2	4	2	-	1	-	-	-	-	-	1	10	1
Calving Difficulty (Exotic Bulls)	4	-	3	-	-	-	-	-	-	-	-	7	1
Calf Scours	4	3	1	1	-	-	-	-	-	-	-	9	1
No Estrous Cycle in Cows and Cystic Cows	2	2	1	1	-	-	-	-	-	-	-	9	1
Total Number of Producers Reporting Breeding Problems	149	111	45	23	15	5	5	1	4	1	7	-	-
Total Number of Producers in Size Category	494	268	107	55	33	12	12	4	6	4	25	1,020	-
Percentage of Total Number of Producers Reporting Breeding Problems	30	41	42	42	45	42	42	25	67	25	28	-	-

NOTE: For example, 7 producers out of the total sample of 1,020 in the 100-199 size of operation category reported artificial insemination problems.

FIGURE 3

MAJOR BREEDING PROBLEMS (TYPES AND INCIDENCE) AS REPORTED BY THE SAMPLE OF 1,020 PRODUCERS

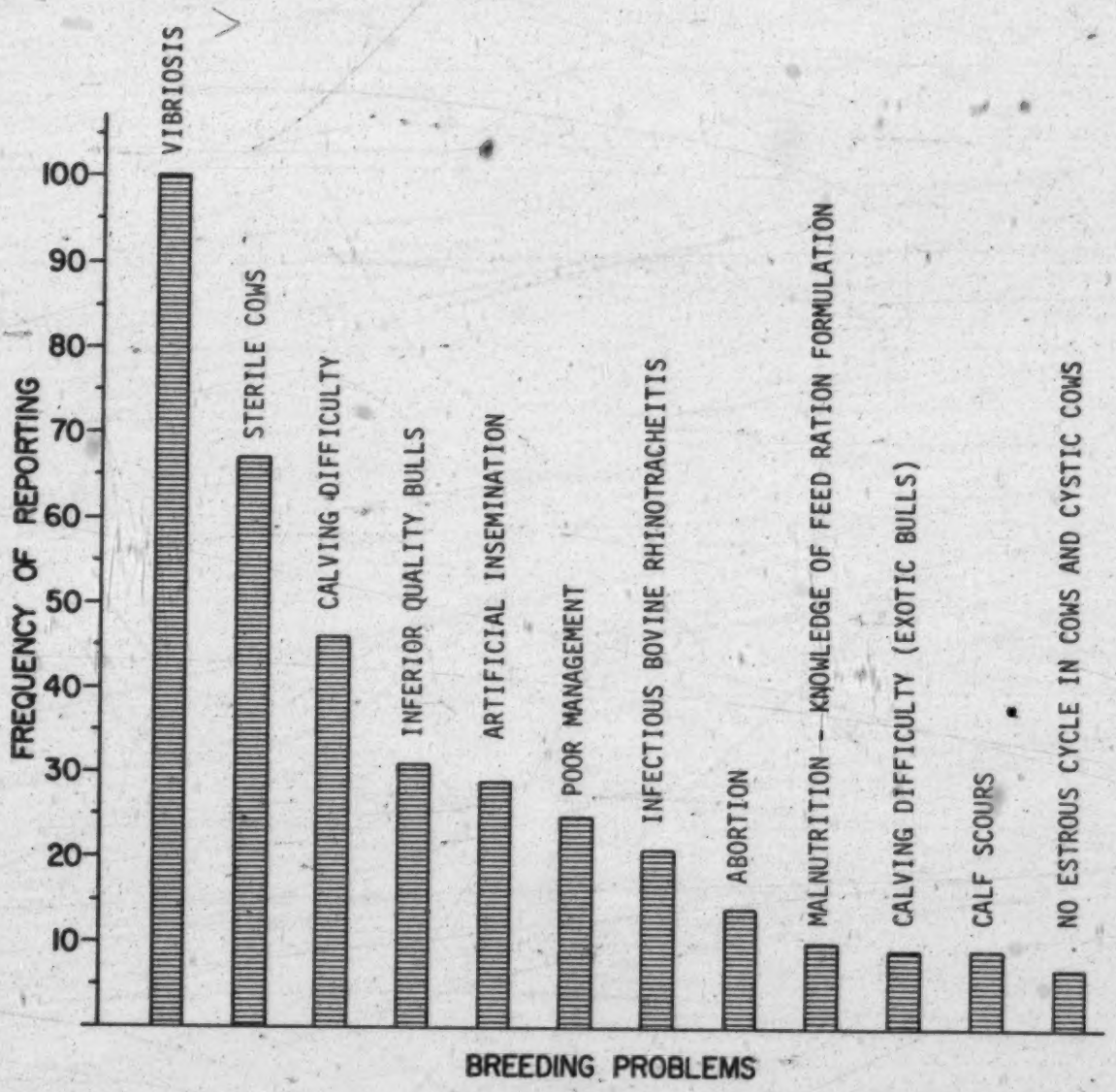

TABLE 9

INCIDENCE OF MAJOR BREEDING PROBLEMS REPORTED, STRATIFIED BY AGRICULTURAL REPORTING AREA, SHOWING NUMBER OF PRODUCERS REPORTING EACH BREEDING PROBLEM, EXPRESSED AS A PERCENTAGE OF THE TOTAL NUMBER OF PRODUCERS REPORTING IN THE AGRICULTURAL REPORTING AREA, AND THE PERCENTAGE OF THE TOTAL NUMBER OF PRODUCERS REPORTING BREEDING PROBLEMS OF VARIOUS TYPES

Breeding Problem	Agricultural Reporting Area 1	2	3	4	5	6	7
Vibriosis	9 10%	11 6%	23 12%	29 13%	19 10%	6 7%	3 6%
Sterile Cows	7 7%	9 5%	15 8%	17 8%	13 7%	2 2%	4 8%
Calving Difficulty	5 5%	11 6%	5 3%	10 5%	4 2%	5 6%	6 12%
Inferior Quality Bulls	2 2%	6 3%	9 5%	3 1%	8 4%	3 4%	- -
Artificial Insemination	4 4%	4 2%	4 2%	9 4%	6 3%	1 1%	1 2%
Poor Management	3 3%	7 4%	3 2%	1 0.4%	4 2%	5 6%	2 4%
Infectious Bovine Rhinotracheitis	-	1 1%	7 4%	7 3%	6 3%	-	-
Abortion	2 2%	2 1%	5 3%	1 0.4%	3 2%	1 1%	-
Malnutrition, Knowledge of Feed Ration Formulation	1 1%	6 3%	2 1%	1 0.4%	-	-	-
Calving Difficulty (Exotic Bulls)	-	3 2%	2 1%	2 1%	-	-	-
Calf Scours	-	1 1%	3 2%	3 1%	1 1%	1 1%	-
No Estrous Cycle in Cows and Cystic Cows	1 1%	1 1%	2 1%	1 0.4%	2 1%	-	-
Total Number of Producers Reporting in the Agricultural Reporting Area	95	189	194	218	191	81	52
Percentage of Total Number of Producers Reporting Breeding Problems	36	33	41	38	34	30	31

NOTE: For example, in Agricultural Reporting Area 3, there are 23 producers or 12% of the area's sample population who report a vibriosis problem.

problems having a reporting frequency of greater than five were recorded (Table 10). Four of these variables--calf scours, pneumonia, hemorrhagic septicemia or shipping fever, and infectious bovine rhinotracheitis--were the most prominent and recorded their greatest frequency of occurrence among the 0 to 300 sized production units. It is important to note that infectious bovine rhinotracheitis can be connected with pneumonia or other respiratory ailments, impaired breeding performance, and abortion. The remainder of the problem variables in Table 10 are of relatively lesser importance.

It is of interest to note that infectious pododermatitis footrot, white muscle disease, blackleg, and mastitis are diseases characteristic of the smaller size operations. One might raise the question whether this, in turn, is related to the knowledgeability of producers of different sizes of operations. Figure 4 summarizes the disease problems with frequency of reporting and ranking of these problems in order of importance.

Table 11 shows the geographic location of the various disease problems by Agricultural Reporting Area. Calf scours manifests itself almost uniformly across the province. The table further indicates that no cases of infectious bovine rhinotracheitis are reported in Agricultural Reporting Area 7. It is possible that, because of the relatively low cattle population in that area as well as there being no terminal market, there is less likelihood of the disease being contracted than in other areas.

Only one case of hemorrhagic septicemia was reported in Agricultural Reporting Area 1. Since many feeder cattle from this area are shipped out of the province, either to U.S.A. and/or Eastern Canada, it

TABLE 10

INCIDENCE OF MAJOR DISEASE PROBLEMS REPORTED, STRATIFIED BY SIZE CATEGORY, SHOWING FREQUENCY OF EACH DISEASE EXPRESSED AS A PERCENTAGE OF TOTAL PRODUCERS WITHIN EACH SIZE CATEGORY AND TOTAL NUMBER OF PRODUCERS REPORTING EACH DISEASE EXPRESSED AS A PERCENTAGE OF THE TOTAL SAMPLE OF 1,020

Disease	Size of Operation (Number of Animals Per Farm)											Total No. of Producers Reporting the Disease	No. of Producers Reporting as a Percentage of Total Sample of 1,020
	0 - 99	100 - 199	200 - 299	300 - 399	400 - 499	500 - 599	600 - 699	700 - 799	800 - 899	900 - 999	1000+		
	(Number of Respondents)												
Calf Scours	69	55	27	11	3	1	4	-	-	1	2	173	17
Pneumonia	36	26	13	8	4	3	2	1	2	1	4	100	10
Hemorrhagic Septicemia	12	21	8	7	8	1	-	1	1	-	4	65	6
Infectious Bovine Rhinotracheitis	24	15	8	6	2	-	1	2	2	-	2	62	6
Bloat	11	16	5	3	3	3	-	-	1	-	2	44	4
Infectious Pododermatitis	15	9	4	-	-	-	-	-	-	-	1	29	3
White Muscle Disease	13	10	3	-	-	-	-	-	-	-	-	26	2
Blackleg	12	4	1	2	-	-	-	-	-	-	-	19	2
Mastitis	9	4	-	-	-	-	-	-	-	-	-	13	1
Urinary Calculi	3	2	4	3	-	-	-	-	-	-	1	13	1
Vibriosis	4	5	-	1	-	-	-	-	-	-	-	10	1
Pink eye	2	2	1	1	1	1	-	-	-	-	1	9	1
Cancer eye	6	1	-	-	-	-	-	-	-	-	-	7	1
Total Number of Producers Reporting Disease Problems	216	170	74	42	21	9	7	4	6	2	19	-	-
Total Number of Producers In Size Category	494	268	107	55	33	12	12	4	6	4	25	1,020	-
Percentage of Total Number of Producers Reporting Disease Problems	44	64	69	76	64	75	58	100	100	50	76	-	-

FIGURE 4

MAJOR DISEASE PROBLEMS (TYPES AND INCIDENCE) AS REPORTED BY THE SAMPLE

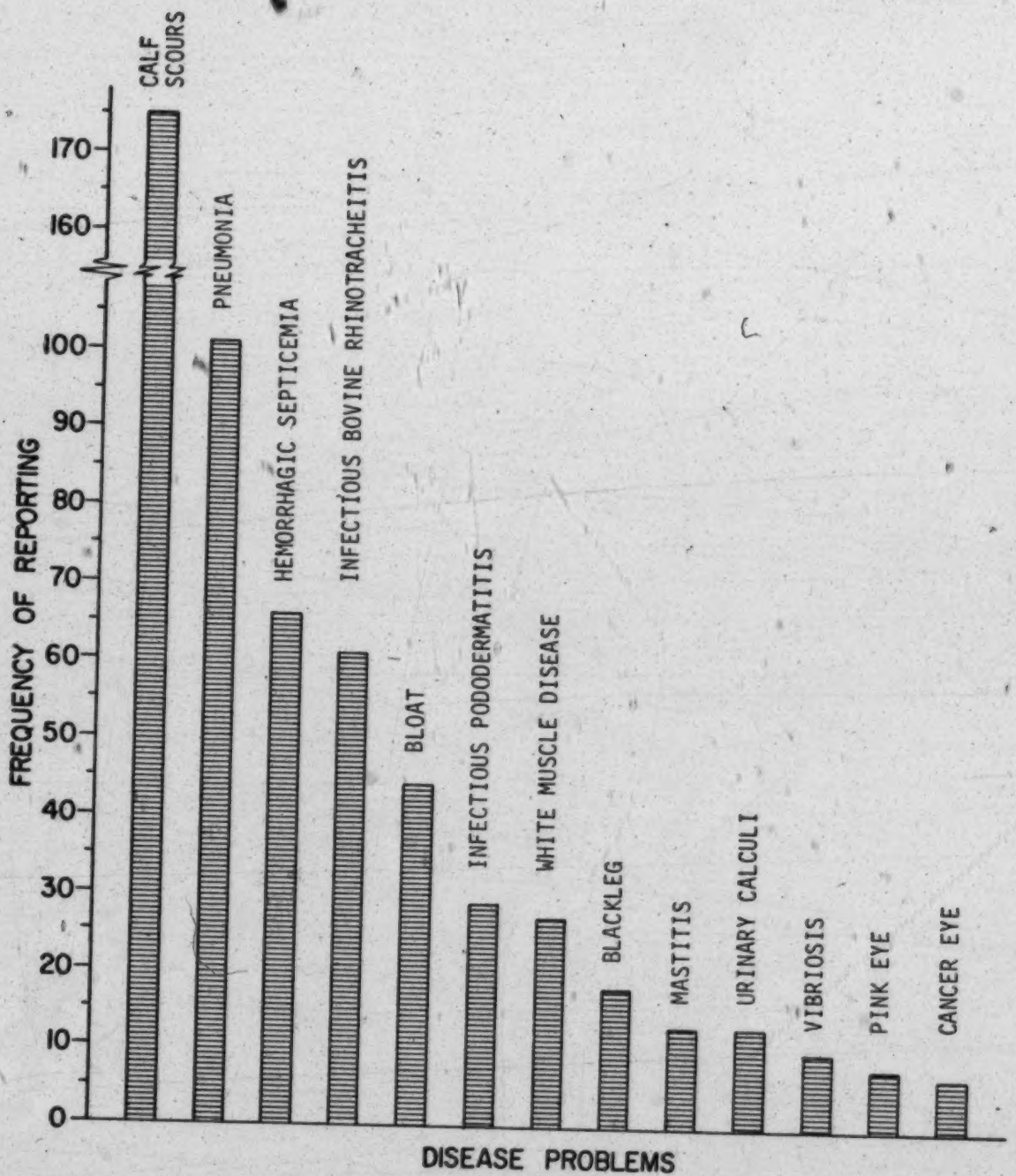

TABLE 11

INCIDENCE OF MAJOR DISEASE PROBLEMS REPORTED, STRATIFIED BY AGRICULTURAL REPORTING AREA, SHOWING NUMBER OF PRODUCERS REPORTING EACH DISEASE, EXPRESSED AS A PERCENTAGE OF THE TOTAL NUMBER OF PRODUCERS REPORTING IN THE AGRICULTURAL REPORTING AREA, AND THE PERCENTAGE OF THE TOTAL NUMBER OF PRODUCERS REPORTING DISEASE PROBLEMS OF VARIOUS TYPES

Disease	Agricultural Reporting Area						
	1	2	3	4	5	6	7
Calf Scours	14 15%	26 14%	40 21%	33 15%	34 18%	17 21%	9 17%
Pneumonia	13 14%	22 12%	14 7%	20 9%	17 9%	12 15%	2 4%
Hemorrhagic Septicemia	1 1%	13 7%	17 9%	14 6%	10 5%	5 6%	5 10%
Infectious Bovine Rhinotracheitis	3 3%	8 4%	16 8%	17 8%	14 7%	4 5%	-
Bloat	1 1%	13 7%	12 6%	8 4%	8 4%	1 1%	1 2%
Infectious Pododermatitis	-	7 4%	-	5 2%	7 4%	4 5%	6 12%
White Muscle Disease	-	-	3 2%	4 2%	18 9%	-	1 2%
Blackleg	1 1%	3 2%	1 1%	7 3%	5 3%	2 2%	-
Mastitis	-	-	-	7 3%	6 3%	-	-
Urinary Calculi	4 4%	4 2%	2 1%	1 1%	2 1%	-	-
Vibriosis	4 4%	2 1%	4 2%	-	-	-	-
Pinkeye	1 1%	3 2%	-	2 1%	-	2 2%	1 2%
Cancer Eye	-	4 2%	3 2%	-	-	-	-
Total Number of Producers Reporting in the Agricultural Reporting Area	95	189	194	218	191	81	52
Percentage of Total Number of Producers Reporting Disease Problems	44	56	58	54	63	58	48

NOTE: For example, in Agricultural Reporting Area 2 there are 26 producers, or 14% of the area's sample population, who report a calf scours problem.

is likely that shipping fever is a problem, but is subsequently not recorded, at least not by Alberta producers. The table further indicates that more than two-thirds of all white muscle disease problems are reported in Agricultural Reporting Area 5 and that nearly all of the problems which are associated with this disease are experienced in Agricultural Reporting Areas 3, 4, and 5.

3. Nutrition Problems -- Table 12 indicates the major nutrition problems experienced by cattle producers. Bloat appears to be the largest problem encountered since a total of 140 out of 1,020 producers, or 14 percent of the sample population, reported the problem. The table points out that, while most of the producers having fewer than 300 animals in their operation are cow-calf operators, the bloat problem records its highest frequency among these producers. The remaining problem variables in Table 12 generally record a relatively low frequency and are thus of minor consequence. Figure 5 summarizes the nutrition problems by frequency of reporting and order of importance.

Considering bloat on a geographical basis, the problem is quite prevalent in Agricultural Reporting Areas 2, 3, 4, and 5 (Table 13). Furthermore, the problem records a low frequency in Agricultural Reporting Areas 1 and 7, both of these being primarily cow-calf regions although differing considerably in intensity of production or output.

4. Marketing Problems -- Grading, auction markets, and transportation are the major problems confronting producers under this heading (Table 14). Some of the complaints listed under "grading" are: (a) lack of uniformity in rail grading; (b) lack of uniformity in type of finish

TABLE 12

INCIDENCE OF MAJOR NUTRITION PROBLEMS REPORTED, STRATIFIED BY SIZE CATEGORY, SHOWING FREQUENCY OF EACH NUTRITION PROBLEM, EXPRESSED AS A PERCENTAGE OF TOTAL PRODUCERS WITHIN EACH SIZE CATEGORY AND TOTAL NUMBER OF PRODUCERS REPORTING EACH NUTRITION PROBLEM EXPRESSED AS A PERCENTAGE OF THE TOTAL SAMPLE OF 1,0202

Nutrition Problem	Size of Operation (Number of Animals Per Farm)											Total No. of Producers Reporting the Problem	No. of Producers Reporting as a Percentage of Total Sample
	0 - 99	100 - 199	200 - 299	300 - 399	400 - 499	500 - 599	600 - 699	700 - 799	800 - 899	900 - 999	1000+		
	(Number of Respondents)												
Bloat	37	45	17	12	12	4	2	1	2	2	6	140	14
Malnutrition, Knowledge of Feed Ration Formulation	13	6	-	3	1	1	-	-	-	-	-	24	2
Poor Management	8	8	-	2	-	-	-	-	-	-	2	20	2
Insufficient or Inferior Quality Roughage	6	5	-	1	-	-	2	-	-	-	-	14	1
Shipping Fever in Feedlot Cattle	2	5	3	2	-	1	-	-	-	-	-	13	1
Pneumonia	1	4	2	1	-	-	-	1	-	-	1	10	1
Lack of Pasture, Pasture Management	9	-	-	-	-	-	-	-	-	-	-	9	1
Laminitis	3	3	1	1	-	1	-	-	-	-	-	9	1
Noxious or Poisonous Weeds in Pasture, Range	2	2	1	1	-	-	-	-	-	-	-	6	1
Total Number of Producers Reporting Nutrition Problems	81	78	24	23	13	7	4	2	2	2	9		
Total Number of Producers in Size Category	494	268	107	55	33	12	12	4	6	4	25	1,020	
Percentage of Total Number of Producers Reporting Nutrition Problems	16	29	22	42	39	58	33	50	33	50	36		

FIGURE 5

MAJOR NUTRITION PROBLEMS (TYPES AND INCIDENCE) AS REPORTED BY THE SAMPLE

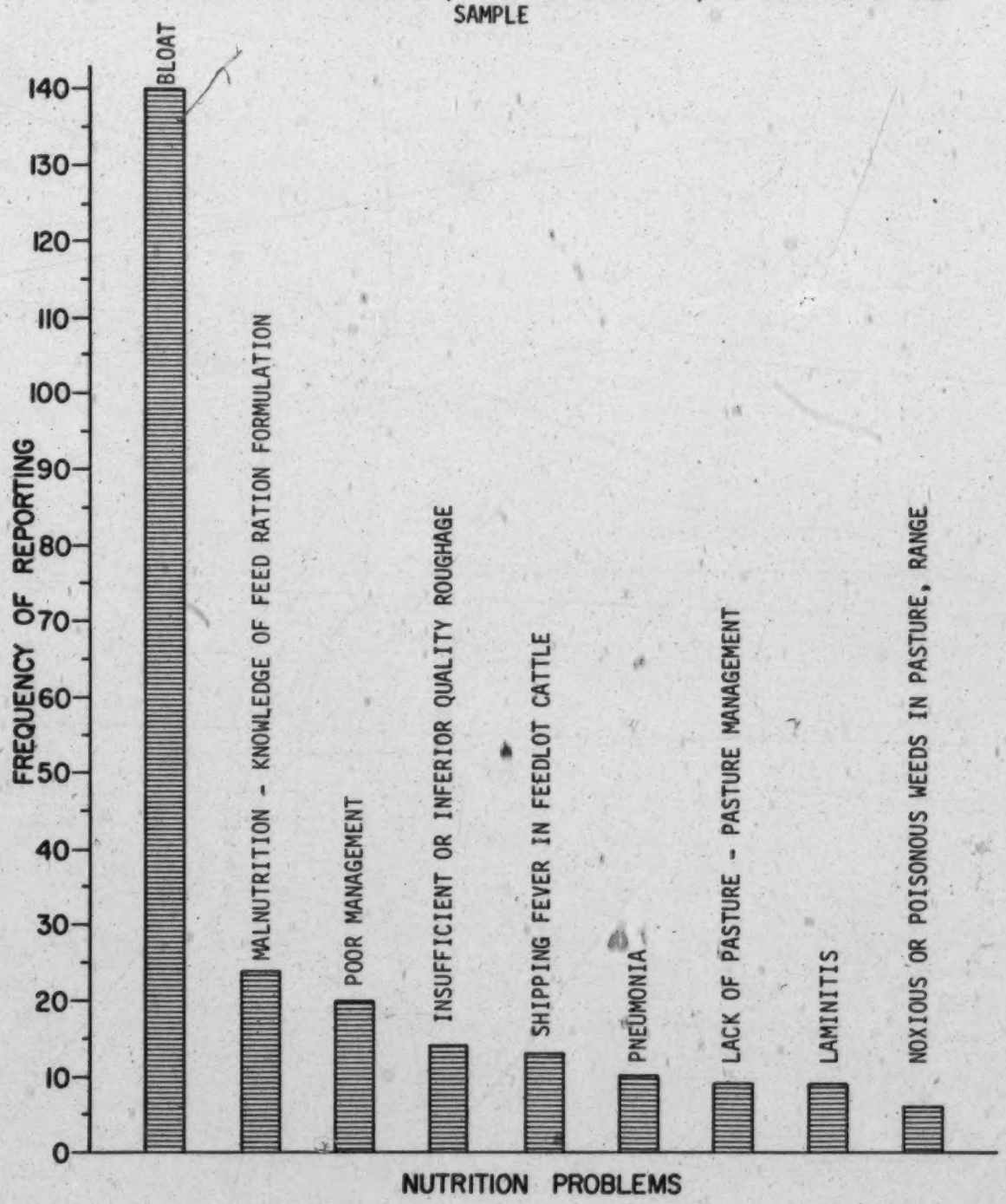

TABLE 13

INCIDENCE OF MAJOR NUTRITION PROBLEMS REPORTED, STRATIFIED BY AGRICULTURAL REPORTING AREA, SHOWING NUMBER OF PRODUCERS REPORTING EACH NUTRITION PROBLEM, EXPRESSED AS A PERCENTAGE OF THE TOTAL NUMBER OF PRODUCERS REPORTING IN THE AGRICULTURAL REPORTING AREA AND THE PERCENTAGE OF THE TOTAL NUMBER OF PRODUCERS REORTING NUTRITION PROBLEMS OF VARIOUS TYPES

Nutrition Problem	Agricultural Reporting Area						
	1	2	3	4	5	6	7
Bloat	10 10%	38 20%	31 16%	22 10%	29 15%	8 10%	2 4%
Malnutrition, Knowledge of Feed Ration Formulation	-	4 2%	3 2%	5 2%	8 4%	2 2%	2 4%
Poor Management	1 1%	8 4%	3 2%	3 1%	2 1%	2 2%	1 2%
Insufficient or Inferior Quality Roughage	4 4%	1 1%	3 2%	2 1%	1 1%	1 1%	2 4%
Shipping Fever in Feedlot Cattle	-	2 1%	3 2%	5 2%	1 1%	1 1%	1 2%
Pneumonia	-	1 1%	5 3%	1 0.4%	2 1%	1 1%	-
Lack of Pasture, Pasture Management	1 1%	-	1 1%	4 2%	-	2 2%	1 2%
Laminitis	1 1%	1 1%	2 1%	2 1%	1 1%	1 1%	1 2%
Noxious or Poisonous Weeds in Pasture, Range	-	1 1%	1 1%	2 1%	-	-	2 4%
Total Number of Producers Reporting in the Agricultural Reporting Area	95	189	194	218	191	81	52
Percentage of Total Number of Producers Reporting Nutrition Problems	18	29	27	21	23	22	23

NOTE: For example, in Agricultural Reporting Area 2, there are 38 producers, or 20% of the area's sample population who report a bloat problem.

TABLE 14

INCIDENCE OF MAJOR MARKETING PROBLEMS REPORTED, STRATIFIED BY SIZE CATEGORY, SHOWING FREQUENCY OF EACH MARKETING PROBLEM EXPRESSED AS A PERCENTAGE OF TOTAL PRODUCERS WITHIN EACH SIZE CATEGORY AND TOTAL NUMBER OF PRODUCERS REPORTING EACH MARKETING PROBLEM EXPRESSED AS A PERCENTAGE OF THE TOTAL SAMPLE OF 1,020

Marketing Problem	Size of Operation (Number of Animals Per Farm)											Total No. of Producers Reporting the Problem	No. of Producers Reporting as a Percentage of Total Sample of 1,020
	0 - 99	100 - 199	200 - 299	300 - 399	400 - 499	500 - 599	600 - 699	700 - 799	800 - 899	900 - 999	1000+		
	(Number of Respondents)												
Grading	17	18	5	4	2	3	1	-	1	-	3	54	5
Auction Markets--Small Size of Charges, Service	20	10	5	5	2	-	2	-	-	1	1	46	4
Transportation--Distance to Market	28	11	3	2	2	-	-	-	-	-	-	46	4
Selling, Price Differential of Feedlot and Open Market	8	14	4	-	-	3	1	-	-	-	-	30	3
Lack of Uniformity in Marketing Price	5	6	2	2	-	-	-	-	-	-	1	16	2
Unfair Buying Practices by Packers, Commission Agents	2	3	3	-	-	-	1	-	-	-	-	9	1
Shrinkage	-	5	1	1	-	-	-	-	-	1	-	8	1
Marketing Information--Delayed, Inadequate, or Incorrect	6	-	-	-	1	-	-	-	-	-	1	8	1
Total Number of Producers Reporting Marketing Problems	86	67	23	14	7	6	5	-	1	2	6	-	-
Total Number of Producers in Size Category	494	268	107	55	33	12	12	4	6	4	25	1,020	-
Percentage of Total Number of Producers Reporting Marketing Problems	17	25	22	25	21	50	42	0	17	50	24	-	-

desired (live weight); (c) price discrimination because of type or breed; and (d) unfair rail grading at packing plants.[1]

Another significant problem encountered in the marketing of livestock concerns the auction markets. According to producers' reports, this particular problem consists of the following components: (a) tighter disease control needed at auction markets; (b) commission charges at these markets reported to be very high; (c) service at auction markets, such as shrinkage at market prior to sale, and improper care or neglect of animals at auction markets; (d) in several cases calves with pneumonia and shipping fever (reported to be brought in from Winnipeg) being sold in this unhealthy condition in southern Alberta auction markets; and (e) auction market too small, hence lack of buying competition.

The third major marketing problem, "transportation", consists of distance to market or from packing centre. Figure 6 summarizes the marketing problems in order of importance and frequency of reporting.

Table 15 shows the geographical location of marketing problems, along with their respective frequency of occurrence. According to this table, Agricultural Reporting Areas 3 and 5 report the greatest frequency of grading problems. Although implicitly indicated by the table but not substantiated, one might surmise that the terminal markets in each of these two Agricultural Reporting Areas are mainly responsible for the grading problem. Furthermore, it is interesting to note that this problem is not reported in Agricultural Reporting Area 7. For obvious reasons,

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[1] The new beef grading system, which became effective on September 5, 1972, may have eradicated or alleviated some of the listed problems under "grading".

FIGURE 6

MAJOR MARKETING PROBLEMS (TYPES AND INCIDENCE) AS REPORTED BY THE SAMPLE

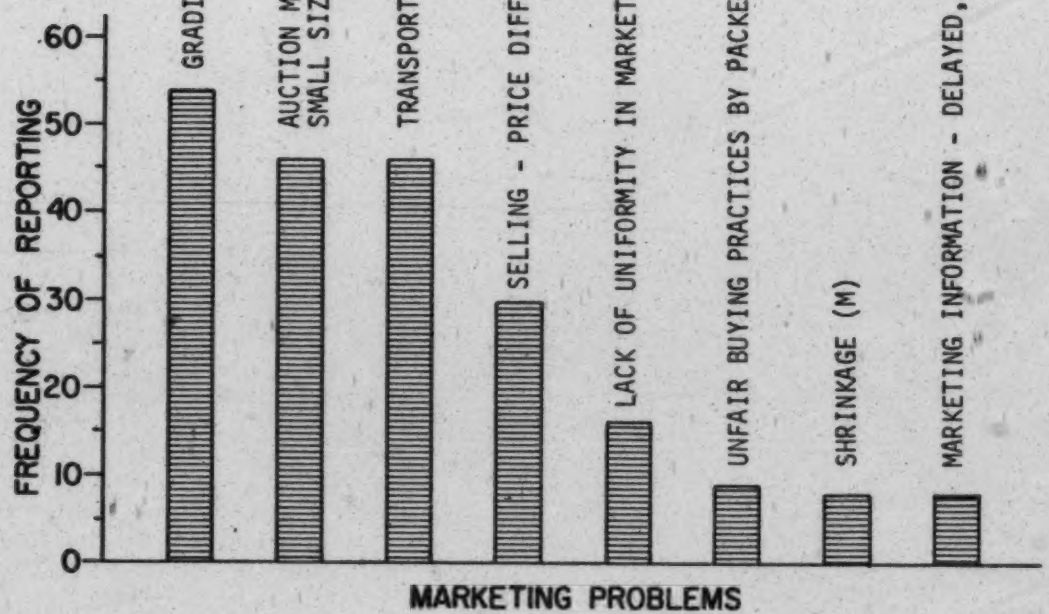

TABLE 15

INCIDENCE OF MAJOR MARKETING PROBLEMS REPORTED, STRATIFIED BY AGRICULTURAL REPORTING AREA, SHOWING NUMBER OF PRODUCERS REPORTING EACH MARKETING PROBLEM EXPRESSED AS A PERCENTAGE OF THE TOTAL NUMBER OF PRODUCERS REPORTING IN THE AGRICULTURAL REPORTING AREA, AND THE PERCENTAGE OF THE TOTAL NUMBER OF PRODUCERS REPORTING MARKETING PROBLEMS OF VARIOUS TYPES

Marketing Problem	Agricultural Reporting Area						
	1	2	3	4	5	6	7
Grading	3 3%	8 4%	14 7%	5 2%	23 12%	1 1%	-
Auction Markets--Small Size of Charges, Service	3 3%	11 6%	10 5%	8 4%	11 6%	2 2%	1 2%
Transportation--Distance to Market	4 4%	4 2%	2 1%	9 4%	2 1%	6 7%	19 36%
Selling--Price Differential of Feedlot and Open Market	-	8 4%	9 5%	6 3%	6 3%	-	1 2%
Lack of Uniformity in Marketing Price	3 3%	2 1%	5 3%	2 1%	3 2%	1 1%	-
Unfair Buying Practices by Packers, Commission Agents	3 3%	-	1 1%	4 2%	-	1 1%	-
Shrinkage	1 1%	1 1%	5 3%	-	-	1 1%	-
Marketing Information--Delayed, Inadequate or Incorrect	1 1%	-	3 2%	1 0.4%	1 1%	1 1%	1 1%
Total Number of Producers Reporting in the Agricultural Reporting Area	95	189	194	218	191	81	52
Percentage of Total Number of Producers Reporting Marketing Problems	19	18	25	16	24	16	42

NOTE: For example, in Agricultural Reporting Area 1, there are 3 producers or 3% of the area's sample population who report a grading problem.

however, this region has the greatest number of percentage of producers reporting a transportation problem. The table also shows that problems concerning auction markets are primarily encountered in Agricultural Reporting Areas 2, 3, and 5.

5. Miscellaneous Problems -- Cattle rustling seems to be the largest single miscellaneous problem afflicting cattle producers. A cursory examination of Table 16 indicates that rustling and financing operations are the only two significant problems. The table further indicates that the remaining problems are generally characteristic of the small producer. Figure 7 illustrates the miscellaneous problems by frequency of occurrence and order of importance.

Table 17 shows the rustling problem to be prevalent throughout the province, although it is most prominent in Agricultural Reporting Areas 6, 4, 3, and 1, in that order. The remaining problems shown in the table are of relatively minor consequence.

Economic Analysis of Data

Preamble

A meaningful economic study involves a decisive procedure through which both present and future costs and benefits can be realistically and objectively quantified. It is not always possible to include all costs and benefits in a project appraisal since not all are readily measurable, particularly with regard to intangibles. Primary and direct costs can be readily measured with a considerable degree of accuracy. Appraisal of secondary effects is much more important from a regional than from a national point of view. This is of considerable significance

TABLE 16

INCIDENCE OF MAJOR MISCELLANEOUS PROBLEMS REPORTED, STRATIFIED BY SIZE CATEGORY, SHOWING FREQUENCY OF EACH MISCELLANEOUS PROBLEM EXPRESSED AS A PERCENTAGE OF TOTAL PRODUCERS WITHIN EACH SIZE CATEGORY AND TOTAL NUMBER OF PRODUCERS REPORTING EACH MISCELLANEOUS PROBLEM EXPRESSED AS A PERCENTAGE OF THE TOTAL SAMPLE OF 1,020

Miscellaneous Problem	Size of Operation (Number of Animals Per Farm)											Total No. of Producers Reporting the Miscellaneous Problem	No. of Producers Reporting as a Percentage of Total Sample of 1,020
	0 - 99	100 - 199	200 - 299	300 - 399	400 - 499	500 - 599	600 - 699	700 - 799	800 - 899	900 - 999	1000+		
	(Number of Respondents)												
Rustling	100	77	31	14	13	1	3	3	3	1	9	255	25
Financing	19	13	7	6	-	3	-	-	-	-	2	50	5
Hunters, Power Toboggans, Vadalism	10	7	3	1	-	1	1	-	-	-	2	25	2
High Interest Rate	15	4	2	1	2	-	-	-	-	-	-	24	2
Missing Stock	5	4	1	-	-	-	-	-	-	-	-	10	1
Veterinarian Services	3	3	1	1	-	-	1	-	-	-	-	9	1
Shortage of Pasture	5	2	-	1	-	-	-	-	-	-	-	8	1
Predators	6	1	-	-	-	-	-	-	-	-	-	7	1
Total Number of Producers Reporting Miscellaneous Problems	163	111	45	24	15	5	5	3	3	1	13	-	-
Total Number of Producers in Size Category	494	268	107	55	33	12	12	4	6	4	25	1,020	-
Percentage of Total Number of Producers Reporting Miscellaneous Problems	33	41	42	44	45	42	42	75	50	25	52	-	-

FIGURE 7

MAJOR MISCELLANEOUS PROBLEMS (TYPES AND INCIDENCE) AS REPORTED BY THE SAMPLE

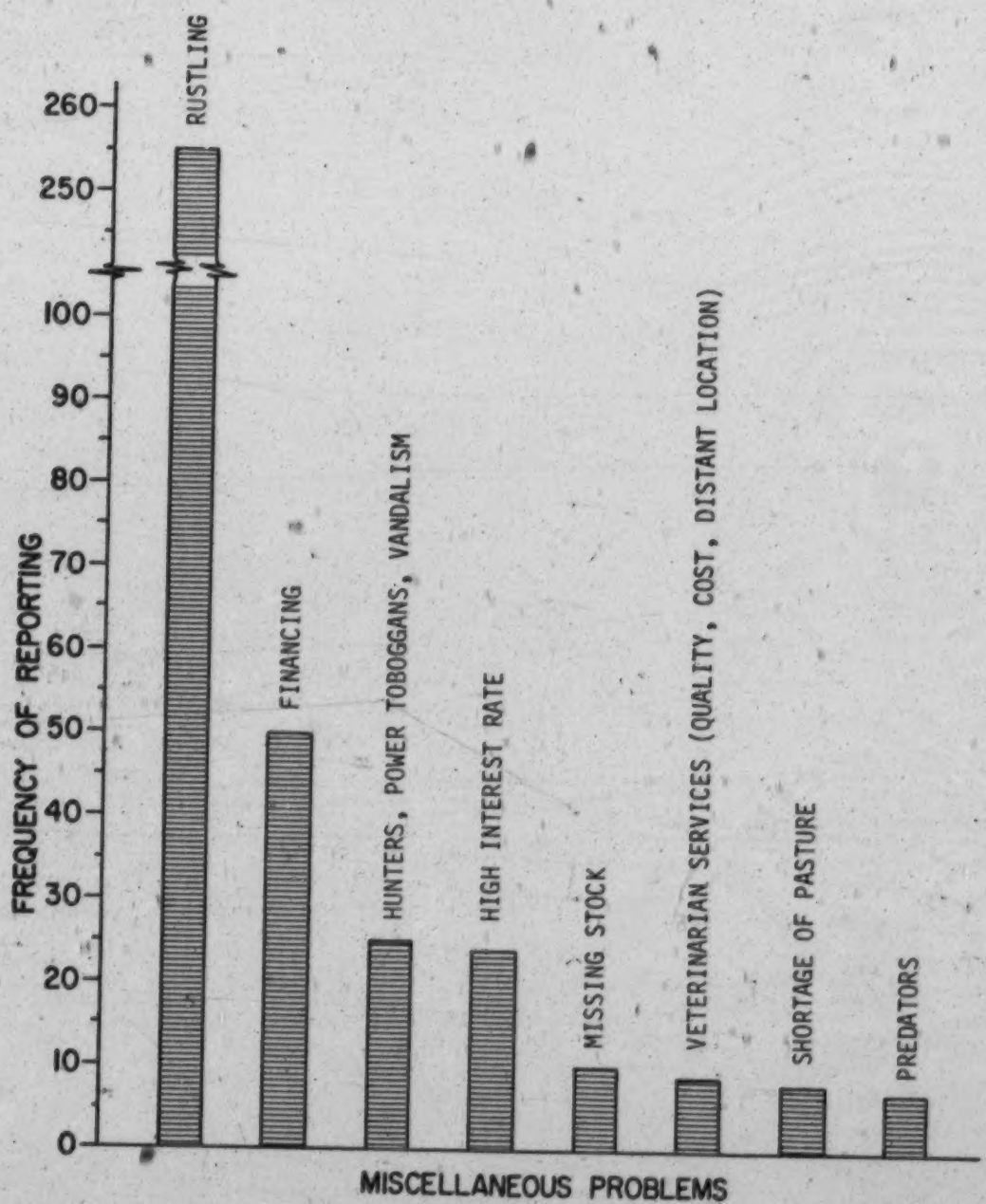

TABLE 17

INCIDENCE OF MAJOR MISCELLANEOUS PROBLEMS REPORTED, STRATIFIED BY AGRICULTURAL REPORTING AREA; SHOWING NUMBER OF PRODUCERS REPORTING EACH MISCELLANEOUS PROBLEM, EXPRESSED AS A PERCENTAGE OF THE TOTAL NUMBER OF PRODUCERS REPORTING IN THE AGRICULTURAL REPORTING AREA AND THE PERCENTAGE OF THE TOTAL NUMBER OF PRODUCERS REPORTING MISCELLANEOUS PROBLEMS OF VARIOUS TYPES

Miscellaneous Problem	Agricultural Reporting Area						
	1	2	3	4	5	6	7
Rustling	24 25%	34 18%	52 27%	65 30%	43 22%	28 35%	9 17%
Financing	7 7%	9 5%	8 4%	8 4%	9 5%	4 5%	5 10%
Hunters, Power Tobaggans, Vandalism	3 3%	5 3%	2 1%	10 5%	4 2%	-	1 2%
High Interest Rate	1 1%	5 3%	6 3%	5 2%	4 2%	2 2%	1 2%
Missing Stock	1 1%	1 1%	2 1%	4 2%	2 1%	-	-
Veterinarian Services	2 2%	-	1 1%	2 1%	1 1%	1 1%	2 4%
Shortage of Pasture	-	6 3%	-	1 0.4%	-	1 1%	-
Predators	-	2 1%	-	-	1 1%	2 2%	2 4%
Total Number of Producers Reporting in the Agricultural Reporting Area	95	189	194	218	191	81	52
Percentage of Total Number of Producers Reporting Miscellaneous Problems	40	33	36	44	33	47	38

NOTE: For example, in Agricultural Reporting Area 1, there are 7 producers or 7% of the area's sample population who report a financing problem.

in Alberta, where livestock production and meat processing, together with their service industry, constitutes a very large portion of Gross Provincial Product.

The objective of the economic appraisal is to obtain some monetary measure of what the reduction in total provincial output might be as a result of the economic losses sustained by individual livestock producers. Livestock enterprise operators in the sample were requested to estimate both the value of reduced livestock production and the estimated loss in profits from their problems for the twelve months immediately prior to receiving the questionnaire. The values for each of these items were tabulated for each major problem area and for each problem variable. The limitations of these procedures are: (a) the estimated loss of profit in relation to value of reduced livestock production reported was inconsistent in some cases; and (b) some producers incurred a loss in profits but did not report a figure for the loss. It was primarily for these reasons rather than "reduced livestock production", that "estimated reduction profit" figure was used as a base from which to proceed in the economic analysis.

Analysis of Profit Loss Data

1. Breeding Problems -- Table 18 summarizes the estimated loss in profit incurred by the livestock producers in each Agricultural Reporting Area for each breeding problem variable. The table lists the problem variables in order of decreasing frequency of reporting. A problem variable having an entire blank row indicates that each of these particular problems are also reported under another major problem area, and the total estimated loss for that problem was recorded under the

TABLE 18

FINANCIAL LOSS IN PROFIT DUE TO BREEDING PROBLEMS, STARTIFIED BY AGRICULTURAL REPORTING AREA, SHOWING ESTIMATED LOSS IN PROFIT, TOTAL LOSS FOR EACH BREEDING PROBLEM AND TOTAL LOSS BY ALL BREEDING PROBLEMS FOR EACH AGRICULTURAL REPORTING AREA

Breeding Problem[a]	Agricultural Reporting Area							Total Loss in Profit for Each Breeding Problem
	1	2	3	4	5	6	7	
				($)				($)
Vibriosis	6,125	9,200	10,743	14,878	26,550	1,550	1,400	70,446
Sterile Cows	3,850	10,530	10,383	14,380	3,600	2,300	1,550	46,593
Calving Difficulty	3,400	1,515	2,120	5,235	850	2,200	2,100	17,420
Inferior Quality Bulls	650	9,500	8,739	4,375	8,650	5,700		37,614
Poor Artificial Insemination Results and Service	1,836	2,277	8,380	1,500	18,450	300	300	33,043
Poor Management Practices	4,000	3,940	480	-	6,205	1,100	1,500	17,225
Infectious Bovine Rhinotracheitis								(Reported under "Diseases")
Abortion	1,000	600	2,475	667	500	200	-	5,442
Malnutrition								(Reported under "Nutrition")
Calving Difficulty (Exotic Bulls)	570	500	1,030	3,850	-	-	-	5,950
Calf Scours								(Reported under "Diseases")
No Estrous Cycle in Cows and Cystic Cows	250	300	1,750	1,450	200	-	-	3,950
Total	21,681	38,362	46,100	46,335	65,005	13,350	6,850	237,683

[a] Listed in descending order of frequency.

major problem area where its greatest frequency of occurrence was reported. It should be noted that in Table 18 the breeding problems are listed according to frequency of reporting. Hence the figures in the last column are not in descending order.

"Vibriosis" and "sterile cows" appear to be the most expensive breeding problems afflicting cattlemen. Nearly half of the total estimated loss in profit for all breeding problems is attributed to these two problems.

2. Disease -- Table 19 reports the estimated loss in profit for each disease, and lists each disease according to decreasing frequency of reporting. Calf scours, pneumonia, hemorrhagic septicemia, and infectious bovine rhinotracheitis account for more than 80 percent of total estimated loss for all diseases, with the remaining diseases reporting a relatively small amount in total estimated loss in profit.

3. Nutrition Problems -- Table 20 shows the estimated loss in profits due to nutrition problems. Bloat appears to be most expensive to the producer, as well as reporting highest frequency of occurrence. Furthermore, this problem is most costly in Agricultural Reporting Areas 2 and 3.

4. Marketing Problems -- Table 21 shows the costs to the producer associated with each of the listed marketing problems. Selling, grading, auction markets, and lack of uniformity in marketing price are most significant.

The "selling" problem variable primarily referred to producers receiving a lower price at the feedlot than on the open market. Furthermore

TABLE 19

FINANCIAL LOSS IN PROFIT DUE TO DISEASES, STRATIFIED BY AGRICULTURAL REPORTING AREA, SHOWING ESTIMATED LOSS IN PROFIT, TOTAL LOSS FOR EACH DISEASE AND TOTAL LOSS BY ALL DISEASES FOR EACH AGRICULTURAL REPORTING AREA

Disease	Agricultural Reporting Area							Total Loss in Profit For Each Disease
	1	2	3	4	5	6	7	
				($)				($)
Calf Scours	6,591	12,323	28,191	13,470	19,060	13,193	4,163	96,900
Pneumonia	2,479	13,841	25,395	11,236	25,247	7,015	1,100	86,313
Hemorrhagic Septicemia	933	8,074	21,463	8,196	9,622	732	2,100	51,120
Infectious Bovine Rhinotracheitis	2,980	8,520	20,926	18,379	23,383	3,400	-	77,588
Bloat								(Reported under "Nutrition")
Infectious Pododermatitis	300	3,215	2,850	3,848	4,450	870	800	16,333
White Muscle Disease	-	-	3,603	8,825	5,155	1,150	400	19,133
Blackleg	2,000	1,375	60	3,416	2,453	750	-	10,054
Mastitis	-	-	1,960	2,615	2,508	1,810	225	9,118
Urinary Calculi	1,604	2,250	1,050	708	1,467	-	-	7,079
Vibriosis	-	-	-	-	-	-	-	(Reported under "Breeding")
Pink Eye	-	2,700	2,025	1,250	567	300	-	6,842
Cancer Eye	-	1,720	400	200	-	-	-	2,320
Total	16,887	53,927	107,923	72,143	93,912	29,220	8,788	382,800

TABLE 20

FINANCIAL LOSS IN PROFIT DUE TO NUTRITION PROBLEMS, STRATIFIED BY AGRICULTURAL REPORTING AREA SHOWING ESTIMATED LOSS IN PROFIT, TOTAL LOSS FOR EACH NUTRITION PROBLEM AND TOTAL LOSS BY ALL NUTRITION PROBLEMS FOR EACH AGRICULTURAL REPORTING AREA

Nutrition Problem	Agricultural Reporting Area							Total Loss in Profit for Each Nutrition Problem
	1	2	3	4	5	6	7	
				($)				($)
Bloat	5,001	23,059	26,771	12,155	12,277	1,775	813	81,851
Malnutrition: Knowledge of Feed Ration Formulation	1,175	2,965	7,183	2,800	5,150	500	350	20,123
Insufficient or Inferior Quality Roughage	9,800	1,100	3,150	-	-	3,000	390	17,440
Shipping Fever in Feedlot Cattle								(Reported under "Diseases")
Pneumonia								(Reported under "Diseases")
Lack of Pasture--Pasture Management	-	500	150	640	-	400	500	2,190
Laminitis	100	200	2,367	190	150	-	300	3,307
Noxious or Poisonous Weeds in Pasture, Range	-	500	-	-	100	100	3,325	4,025
Total	16,076	28,324	39,621	15,785	17,677	5,775	5,678	128,936

TABLE 21

FINANCIAL LOSS IN PROFIT DUE TO MARKETING PROBLEMS, STRATIFIED BY AGRICULTURAL REPORTING AREA, SHOWING ESTIMATED LOSS IN PROFIT, TOTAL LOSS FOR EACH MARKETING PROBLEM AND TOTAL LOSS BY ALL MARKETING PROBLEMS FOR EACH AGRICULTURAL REPORTING AREA

Marketing Problem	Agricultural Reporting Area							Total Loss in Profit for Each Marketing Problem
	1	2	3	4	5	6	7	
				($)				($)
Grading	380	7,175	4,400	3,192	17,520	750	-	33,417
Auction Markets: Insufficient Size of Charges, Services	-	7,542	2,750	7,217	7,535	1,100	75	26,219
Transportation, Distance to Markets	1,500	2,250	675	4,770	1,585	1,850	2,128	14,758
Selling--Price Differential of Feedlot and Open Market	-	5,625	6,233	17,317	7,550	-	600	37,325
Lack of Uniformity in Marketing Price	2,625	9,000	11,783	350	2,200	-	-	25,958
Unfair Buying Practices by Packers, Commission Agents	530	400	-	14,950	-	500	-	16,380
Shrinkage	-	3,000	3,500	450	-	-	-	6,950
Marketing Information--Delayed, Inadequate, or Incorrect	-	-	1,467	-	4,600	325	600	6,992
Total	5,035	34,992	30,808	48,246	40,990	4,525	3,403	167,999

some producers reported that they did not really know what the price should be, allowing for shrinkage and distance the livestock was transported. Among the "grading" problems, the following complaints were listed: (a) lack of uniformity in rail grading, unfair rail grading, or lack of uniformity in type of live weight finish desired; and (b) price discrimination because of type of breed.

Auction markets were responsible for a myriad of problems, some of which are: (a) commission charges, (b) service, (c) shrinkage before sale, (d) small size of auction market resulting in lack of buying competition, (e) improper care or neglect of animals, and (f) tighter disease control needed. The last, but not least important problem variable reported was the shipment of young dairy calves by truck from eastern Canada. Some of these calves were arriving either dead in the trucks or in diseased condition, and they frequently were sold before being brought back to good health; hence the farmer sustained the financial loss when death occurred after purchase. This particular problem was reported only at auction markets located in the Lethbridge-Medicine Hat region.

5. Miscellaneous Problem -- Table 22 shows the estimated loss in profit to livestock producers due to various miscellaneous problems. The problems in the table are listed in order of decreasing frequency of reporting. "Rustling" and "financing" are most costly to producers in terms of estimated loss in profit, with the former being of particular significance in Agricultural Reporting Area 4. Nearly one-half of the total estimated loss in profits due to all miscellaneous problems is attributed to this particular problem.

TABLE 22

FINANCIAL LOSS IN PROFIT DUE TO MISCELLANEOUS PROBLEMS, STRATIFIED BY AGRICULTURAL REPORTING AREA SHOWING ESTIMATED LOSS IN PROFIT, TOTAL LOSS FOR EACH MISCELLANEOUS PROBLEM AND TOTAL LOSS BY ALL MISCELLANEOUS PROBLEMS FOR EACH AGRICULTURAL REPORTING AREA

Miscellaneous Problem	Agricultural Reporting Area							Total Loss in Profit for Each Miscellaneous Problem
	1	2	3	4	5	6	7	
				($)				($)
Rustling	6,203	10,120	13,987	34,415	14,145	8,850	3,350	91,070
Financing	14,100	6,740	17,300	1,850	4,050	6,555	2,900	53,495
Hunters, Power Toboggans, Vandalism	325	2,850	475	4,030	1,740	-	588	10,008
High Interest Rate	-	800	3,000	2,650	2,400	175	1,500	10,525
Missing Stock	1,100	-	800	1,000	200	-	-	3,100
Veterinarian Services (Quality, Cost, Distant Location)	600	-	-	2,200	-	-	338	3,138
Shortage of Pasture								(Reported under "Nutrition")
Predators	343	1,700	-	5,200	300	180	6,150	13,873
Total	22,671	22,210	35,562	51,345	22,835	15,760	14,826	185,209

Estimated Total Financial Loss for the Sample Population

Estimated loss in profits resulting from all problem variables in the five major problem areas add up to a grand total of $1,102,627 for the sample population. However, adjustments in these figures must be made to allow for those problem variables with a reported frequency of five or less (for which no values of estimated loss in profits and frequency of occurrence are shown in the respective tables).

The tables in Appendix B show the problem variables with a frequency of five or less for each of the major problem area--breeding, disease, nutrition, marketing, and miscellaneous problems. Adjustments to account for these particular problem variables are made by considering the total frequency of these problem variables in each major problem area and proportionately adding their estimated loss in profits to each major problem area total estimated loss in profits. This would increase the total estimated loss in profits due to all breeding problems in the sample population from $237,683 to $253,918; for disease problems from $283,800 to $415,036; for nutrition problems from $128,936 to $148,934; for marketing problems from $167,999 to $180,386; and for miscellaneous problems from $185,209 to $200,484. Thus the adjusted sample total loss in profits is $1,198,758.

Financial Loss Projections for Total Population

Table 6 shows that the sample of cattle producers reported a total cattle and calf population of 201,435 animals. The number of producers selected in the sample totaled 1,020, or 3.11 percent of the province's livestock brand holders. However, 201,435 animals represents 5.2 percent of Alberta's 1972 total cattle and calf population (see Table 3).

In deriving conservative figures for estimated loss in profits for all producers, the figure of 5.2 percent was used rather than the sample size as a percentage of total number of producers. Proceeding on this basis, the following totals of estimated loss in profits in each major area for all producers are:

Breeding problems	$ 4,882,843
Disease problems	7,981,142
Nurtition problems	2,864,001
Marketing problems	3,468,823
Miscellaneous problems	3,855,307
GRAND TOTAL	$23,052,116

The estimated loss in profits thus derived must be interpreted with caution due to several reasons. Contributing factors to the credibility of these figures are: first, the size of operations are not normally distributed, as indicated by Table 6. Thus, we are dealing with a skewed sample distribution, hence we would expect the population to be skewed also. Moreover, such a distribution does not readily lend itself to statistical analysis. Secondly, some producers reported particular problems but were unable to accurately estimate financial loss, hence no figures were given. Thus sample bias is introduced by at least these two factors. This bias will be toward the conservative side.

Analysis of Population Estimates

Total estimated loss in profits to all of Alberta's livestock producers is $23,052,116. This represents 7.7 percent of

Alberta's total cattle sales of $298,287,000 in 1972 (see Table 4). One can argue the point that ready markets cannot always be found for this additional livestock output without having a somewhat depressing effect on cattle prices; however, this depends on the extend to which reported profit losses are the result of decreased cattle output or increased costs. It is likely that profit losses are due partly to both.

The impact of livestock problems with respect to value of production is of greater importance than is the loss in profit to the livestock producers when considered from a gross provincial point of view. However, the extent of the impact is for a large part determined in profitability of livestock production. For example, if loss of profit to the livestock producers represents 10 percent of the value of production, then the total value of production foregone by the livestock problems amounts to 100/10 x $23,052,116=$230,521,160. Similarly, if the livestock producer receives 20 cents net profit on each dollar value of production, then the total value of production not realized is 100/20 x $23,052,116 = $115 million approximatley. This figure would change to approximately $154 million if the net income to the livestock producer was 15 cents on each dollar worth of value of production.

While the above appraisal provides an estimate of direct producer loss, the output multiplier quantifies more accurately the real effects of reduced output on a region's gross output. An output multiplier expresses the total change in the value of a region's gross output (income) induced by a one dollar change in final demand for products of a particular industry.

Work has been done by several researchers in attempting to relate the multiplier concept to the agricultural industry. In general, it is known that the multiplier effect from beef production is greater than the average multiplier effect from agricultural production. Particular reference is made here to secondary and service industries. Wright estimates the average multiplier effect from Alberta's agriculture to be 1.57.[1]

According to Josling and Trant, the output multiplier for cattle is 2.1583.[2] These researchers feel that livestock sectors appear to have relatively high Final Demand Multiplier, which reflects the close dependence on other sectors. Still another team of researchers, Yeh and Lin, state that the Final Demand Multiplier, or the total effect on output of an increase in final demand of one dollar, for the livestock sector is $1.65.[3]

In summary, it is estimated that the annual losses are as follows: (a) to cattle producers in the province, $23,052,116; (b) to the livestock sector in the province, in terms of reduced cash receipts a range of $115 million to $230 million, with the $115 million being a conservative figure. Providing that ready markets exist for more beef, the provincial cash receipts from cattle and calves sales could thus be increased from $298 million to over $400 million annually using conservative figure.

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[1] R.W. Wright, The Alberta Economy: an Input-Output Analysis, Bulletin (Calgary: The University of Calgary)

[2] J.T. Josling and G.I. Trant, Interdependence Among Agricultural and Other Sectors, Publication No 2 (Ottawa: Agricultural Economics Research Council of Canada, 1966), p. 23.

[3] M.H. Yeh and L. Lin, "Technical Change in the Canadian Livestock Industry: An Input-Output Approach", Canadian Journal of Agricultural Economics, Vol. 17, No. 2, p. 78

With the aforementioned figures in mond, it appears justifiable to spend substantial sums of money on major research problems such as calf scours and vibriosis, to name but a few. In addition to present financial contributions to research by livestock producers and the provincial government, the senior level of government and the meat packers might also make contributions since they too are beneficiaries of a more efficient and more productive livestock industry.

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

The results of this research have provided an insight into the predominant problems encountered by Alberta beef producers. The study indicates that in the production of cattle, the four largest problems occurred in the areas of reproduction and diseases (vibriosis, sterile cows, calf scours, and pneumonia). These were followed by the problem of rustling, while the remaining problems recorded a relatively lower incidence. The above problems also accounted for the five highest areas of financial loss amounting to 1.7 percent of total reported profit losses. It is important to bear in mind that the problems analyzed herein are reported as identified by the producer, regardless of whether he perceived these correctly. This aspect is of special significance in analyzing the breeding problems since there are several problem variables where a cross-relationship exists. This difficulty is further aggravated by the absence of differentiation of managerial ability among producers.

The analysis of this research project should be regarded as subordinate to a more detailed appraisal of livestock production problems based upon stratified sampling, which would classify producers according to factors such as educational background, managerial ability, factors of production or resources at hand, gross annual livestock sales, etc.

The sample drawn for the completed analysis consituted a skewed distribution, hence the population is likely to be skewed also. It can

be expected that the larger operators are more knowledgeable with respect to livestock production, and they would more accurately describe the problems associated with their own operation and with the livestock industry.

The estimated financial losses resulting from the various problems to the livestock industry and to the gross provincial output cause a considerable economic impact, and are conservatively quantified utilizing the output multiplier concept. Finally, the important conclusion of this study is that further research funds used for dealing with the major problems associated with reproduction and diseases would appear to be well spent in relation to the potential benefits.

Recommendations

Based upon the analysis in this study, it seems justified to direct funds towards research in the two major areas--breeding and disease--which are plaguing livestock producers. More specifically, it would appear profitable to increase research in the areas of vibriosis, sterility, calf scours, and pneumonia. To obtain desirable results at the producer level, it is imperative that agencies other than research take responsibility and play an active role toward the realization of the recommendations and objectives listed below.

1. It is recommended that the individuals and agencies involved in making decisions concerning the allocation of funds direct more money and resources toward research into the main problem areas--vibriosis, sterile cows, calf scours, and pneumonia. Furthermore, the results of this study should be used as a basis in establishing research priorities for beef cattle problems.

2. Since the survey in this study is quite aggregative, additional research must be done in each major problem area to provide greater detail. Foe example, one may wish to find out whether a certain number of cattle and calves producers are not aware of or not applying certain techniques or new technology in the production of livestock.

3. Since many livestock producers, particularly those with relatively small operations, lack adequate managerial ability to operate successful beef cattle enterprises, it seems advisable that appropiate measures be taken to upgrade the knowledge of livestock producers in this category.

4. In view of the many producer problems associated with the marketing of livestock, it seems warranted to undertake further studies on the feasibility of alternative methods of marketing of all classes of beef cattle. If, in fact, such methods would prove to be feasible, then a myriad of other problems which are presently associated with auction markets would also be eradicated or at least alleviated.

5. Cattle rustling is also a problem of no small magnitude and is a matter which should be reviewed by provincial and/or federal law authorities.

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APPENDIX A

INVENTORY OF MAJOR RESEARCH NEEDS IN THE ALBERTA CATTLE INDUSTRY

A. I. Kind of cattle enterprise or enterprises you operate. Please check only those appropriate to your operation in order of importance. (The most important -A; the second most important -B; etc.)

1. _____ Cow-calf--sold as calves
2. _____ Cow-calf--sold as yearling
3. _____ Cow-calf--calves fed out and sold
4. _____ Purebreed cow herd--selling breeding stock
5. _____ Buy graze and feed out yearling
6. _____ Buy graze and feed out older cattle
7. _____ Feedlot operation-private
8. _____ Feedlot operation-custom
9. _____ Feedlot operation-private and custom
10. _____ Commercial, dairy
11. _____ Cattle out on shares
12. _____ Other (Specify _____)
13. _____ Buy winter and graze calves
14. _____ Buy winter and graze yearlings
15. _____ Buy winter and graze yearlings of 2 years old
16. _____ Other cattle operations
Please describe:

A. II. What was the largest number of cattle on hand in your operation during the past 12 months?

17. _____ Beef Cow Herd 18. _____ Dairy Cow Herd

19. _____ Replacements 20. _____ Feeder Cattle

21. _____ Total

B. Please list your cattle problems under the following headings:

I. Breeding Problems

As a stockman please list in their order of importance?

22. The major cattle breeding problems affecting the industry.

_____

_____

23. Which, if any, of the breeding problems listed above caused financial losses to you during the past year?

_____

_____

24. Please estimate the financial losses these breeding problems have caused you during the past 12 months:

a) Value of reduced livestock production $_____

b) Loss of profit $_____

II. Disease Problems

Please list in their order of importance in your community:

25. The major cattle disease problems affecting the industry.

_____

_____

26. Which, if any, of the disease problems listed above caused financial losses to you during the past year?

_____

_____

27. Please estimate the financial losses these disease problems have caused you during the past 12 months in:

a) Value of reduced livestock production $_____

b) Loss of profit $_____

c) Vet. + Med. costs $_____

III. Feeding Problems

28. Please list in their order of importance in your community the major cattle feeding problems affecting the industry.

_____

_____

29. Which, if any, of the feeding problems listed above caused financial losses to you during the past 12 months?

_____

_____

30. Please estimate the financial losses these feeding problems have cost you during the past 12 months:

a) Value of reduced livestock production $_____

b) Loss of profit $_____

IV. Marketing Problems (assembling, transportation, grading, selling, etc.)

31. Please list in their order of importance in your community the major cattle marketing problems affecting the industry.

_____

_____

32. Which, if any, of the marketing problems listed above have caused you financial losses during the past year?

_____

_____

33. Please estimate the total loss in profit these marketing problems have cost you during the past 12 months.

$_____

34. V. Other Problems (Rustling, financing, etc.) Please state problem.

_____

_____

35. Please estimate the total loss in profits. $_____

36. Your trading centre _____

Please do not sign the questionnaire unless you wish to do so.

Thank you for helping the research team. A stamped self-addressed envelope is enclosed for your convenience in reply.

APPENDIX B

TABLE B.1

PRIMARY BREEDING PROBLEMS

Breeding Problem	Frequency of Reporting
Retained placenta	5
Information needed on crossbreeding (exotic breeds)	4
Cows losing calves and weak calves during winter	4
Premature calving	4
Prolapsing	3
Stillborn calves	3
Metritis	2
TOTAL	25

TABLE B.2

PRIMARY DISEASE PROBLEMS

Disease Problem	Frequency of Reporting
Milk fever	5
Malnutrition - knowledge of feed ration formulation	5
Abortion	4
Coccidiosis	4
Unidentified early calf diseases	4
Pulmonary emphysema	4
Acute rumen overload	3
Poor management	3
Respiratory problems - infection	3
Malignant edema	3
Hardware disease	2
Retained placenta	2
Kidney disease	2
Eye infections	2
Redwater disease	2
TOTAL	48

TABLE B.3

PRIMARY NUTRITION PROBLEMS

Nutrition Problem	Frequency of Reporting
Long winter feeding period	5
Acute rumen overload	5
Starting cattle on grain	4
Urinary calculi	4
Incompetent or expensive help	3
Infectious pododermatitis	3
Selenium deficiency	2
Inadequate shelter	2
Poor feedlot condition during wet weather	2
Poor feed conversion	2
Lack of facilities - capital	2
Water shortage - low quality water	2
Infectious Bovine Rhinotracheitis (IBR)	2
TOTAL	38

TABLE B.4

PRIMARY MARKETING PROBLEMS

Marketing Problems	Frequency of Reporting
Unfair shrink dockage by packer-buyer at feedlot purchases	5
Cattle Commission deduction	3
Tighter disease control needed at auction markets	3
Price differential of heifers and steers too great	3
Discrepancy between eastern and western Canada meat prices	2
TOTAL	16

TABLE B.5

MISCELLANEOUS PROBLEMS

Miscellaneous Problems	Frequency of Reporting
Long winter feeding period	5
Undue government interference	5
Incompetent or expensive help	5
Feeder cattle - uneven or short supply	5
High cost of raising feed	4
Rising cost of production	2
Poor management	2
Excavations and oil spills causing injury or loss of animals	2
Marketing information - delayed, inadequate, or incorrect	2
TOTAL	32